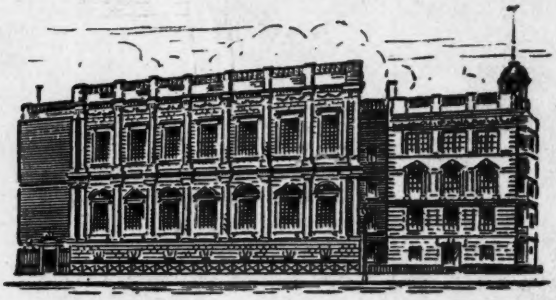
Vol. LXXV. NOVEMBER, 1930 No. 500

JOURNAL



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				337,439,213	14	9
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				15,858,217	0	0
Reserve Fund				10,250,000	0	0
				£385,539,358	13	1

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Cash in hand, and with the Bank of England				51,850,334	5	9
Balances with other British Banks and Cheques in course of collection				10,818,386	9	9
Money at Call and Short Notice				23,582,200	0	0
Bills Discounted				36,966,668	4	8
Investments (Including £641,380 5s. 8d. lodged as security for Public Authority and other Accounts):	£	s.	d.			
Securities of, or guaranteed by, the British Government	49,950,066	9	10			
British Dominions and Colonial Government Securities, Bank of England and British Corporation Stocks	2,286,263	2	6			
Other Investments	500,460	6	4			
				52,736,789	18	8
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Advances:—						
Customers and other Accounts	172,926,487	16	8			
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Balances in account with Subsidiary Banks	1,459,408	10	0			
				174,454,652	3	9
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Commissioned Officers of *all* H.M. fighting Services, including those of the Dominions, Colonies and India, and Midshipmen of the Royal Navy, Royal Naval Reserve and Royal Naval Volunteer Reserve, are eligible for membership without proposal or ballot.

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THE INSTITUTION.

The Royal United Service Institution is situated just below the War Office in Whitehall. It has the best professional Library in the United Kingdom; a Lecture Theatre where an autumn and winter session of lectures is devoted to subjects of current or historical Service interest. The Reading and Smoking Rooms are provided with the leading papers, periodicals and writing materials.

The Institution is open daily from 10 a.m. to 7 p.m., except Sunday, Christmas Day and Good Friday.

THE JOURNAL.

The R.U.S.I. JOURNAL is published quarterly and sent post free to Members in any part of the world.

THE MUSEUM.

Situated in the Banqueting Hall of the old Palace of Whitehall (1622), with its magnificent Rubens ceiling, the R.U.S.I. Museum is a treasure house of relics and mementoes of great victories and renowned warriors. There is also a most valuable collection of Uniforms, Medals, Ship Models, and models of the battles of Trafalgar and Waterloo.

For Members and their friends, there are private entrances to the Museum from the Institution.

H.M. Forces in uniform are admitted free at the public entrance.

Admission to the general public is 1s.; Saturday after Noon, 6d.

SECRETARY'S NOTES

November, 1930.

Centenary Celebration, 1931.

Attention is invited to page 830 of this Journal giving a further notice in regard to the celebration of the Centenary of the Foundation of the Royal United Service Institution.

Centenary Fund.

The Centenary Committee beg to acknowledge the receipt of donations to the Centenary Fund from the following Members :—Lieutenant R. D. Hughes, R.N., Major C. H. de Roemer, Lieutenant-Commander H. Longsdon, R.N., Captain P. M. C. Hayman, Lieut.-Colonel G. Bowring, Lieutenant-Colonel Sir Vivian Henderson, Captain F. L. Cubitt, Lieut.-Colonel W. Martin-Leake.

Message of Condolence on the loss of "R.101."

The following message of condolence was sent to the Chief of the Air Staff on the loss of the airship " R.101 " :—

> " Chairman and Council of the Royal United Service Institution assembled this afternoon desire to express to you and the Air Council their sincerest sympathy in the loss of your Secretary of State and the many other valuable lives in the disaster to ' R.101.' "

The following reply was received :—

> " On behalf of myself and the Air Council I wish to thank you and your Council for your very kind message of sympathy on the disaster which has befallen the ' R.101.' The Royal Air Force and others connected with aviation will very keenly feel the loss of so many valuable lives for many years to come."

Council.

The Council regret to have to report that Admiral Sir William Goodenough, G.C.B., M.V.O., who has been Vice-Chairman of the Council since the last Annual General Meeting, has felt compelled to resign owing to the many calls on his time since he has been elected President of the Royal Geographical Society. Admiral of the Fleet Sir Roger J. B. Keyes, Bart., K.C.B., K.C.V.O., C.M.G., D.S.O., LL.D., D.C.L., has been elected a naval Member and Vice-Chairman of the Council in succession to Admiral Sir William Goodenough.

Rear-Admiral C. V. Usborne, C.B., C.M.G., has succeeded Rear-Admiral B. E. Domvile, C.B., C.M.G., as Admiralty Representative on the Council.

Air Commodore P. B. Joubert de la Ferté, C.M.G., D.S.O., has succeeded Air Vice-Marshal E. R. Ludlow-Hewitt, C.B., C.M.G., D.S.O., M.C., as an *ex-officio* Member of the Council on succeeding the latter as Commandant of the Royal Air Force Staff College.

New Members.

The following Officers joined the Institution during the months of August, September and October :—

ROYAL NAVY.

Midshipman N. McI. Kemp, R.N.
Paymaster Lieutenant W. J. G. Prophit, R.N.
Lieutenant P. Bethell, R.N.
Commander R. D. Oliver, D.S.C., R.N.
Captain B. W. M. Fairbairn, O.B.E., R.N.
Commander A. T. Stewart, O.B.E., R.N.
Captain J. V. Creagh, D.S.O., R.N.
Commander P. T. Perkins, R.N.R.

ARMY.

Gentleman-Cadet H. A. F. Hohler.
2nd Lieutenant W. F. R. Turner, K.O.S.B.
2nd Lieutenant J. Sanderson, K.O.S.B.
Captain N. C. O'Morchoe, 15th Punjab Regiment.
2nd Lieutenant L. Cromwell, The Manchester Regiment.
2nd Lieutenant N. Baillie-Stewart, The Seaforth Highlanders.
2nd Lieutenant M. J. D. Drummond, The Seaforth Highlanders.
2nd Lieutenant R. W. G. Robertson-McIsaac, The Seaforth Highlanders.
Captain S. L. C. Lane, The Cheshire Regiment.
2nd Lieutenant W. E. J. Waters, K.O.S.B.
2nd Lieutenant A. E. Green, The Middlesex Regiment.
2nd Lieutenant D. E. B. Talbot, Queen's Own Royal West Kent Regiment.
Lieutenant H. J. S. Douglas, The Scots Guards.
2nd Lieutenant D. H. Tadman, K.O.S.B.
Captain S. C. R. L. Clarke, The Wiltshire Regiment.
Gentleman-Cadet E. J. E. Mozley.
2nd Lieutenant The Hon. R. C. Bigham, R.A.
Captain G. H. N. Todd, M.C., 9th Lancers.
2nd Lieutenant P. C. Taylor, The Hampshire Regiment (T.A.).
Captain N. G. Duckett, R.A.S.C.
Lieutenant G. A. K. Meyer, R.H.A.
Lieutenant J. R. Hannay, K.O.S.B.
Captain A. S. P. Murray, Grenadier Guards.
2nd Lieutenant E. M. Bainbridge, Scots Guards.
2nd Lieutenant T. S. Fermor-Hesketh, Scots Guards.
2nd Lieutenant R. D. M. Gurowski, Scots Guards.
2nd Lieutenant J. S. Sanderson, Scots Guards.
Captain J. T. Crocker, D.S.O., M.C., Royal Tank Corps.
Captain G. M. St. Leger, R.A.

Captain C. J. Wilson, K.R.R.C.
Lieutenant C. W. Holdsworth-Hunt, Northumberland Fusiliers.
Lieutenant A. J. Macdonald, R.E.
Captain J. F. B. Vandeleur, R.A.S.C. (retired).
Captain G. E. Caswell, Northumberland Fusiliers (retired).
2nd Lieutenant A. R. W. Shipley, Queen Victoria's Rifles.
Lieutenant G. H. G. Smith-Dorrien, The King's Royal Rifle Corps.
Colonel W. Garforth, D.S.O., M.C., R.E.
Captain R. L. de Brisay, The Lincolnshire Regiment.
Captain A. Gilroy, The Black Watch.
2nd Lieutenant H. I. G. Stewart, H.L.I.
Lieutenant J. E. Marsh, R.E.
Colonel J. Kennedy, C.M.G., D.S.O.
Lieutenant E. V. H. Hudson, The Middlesex Regiment.
Captain N. L. Angelo, 2/19th Hyderabad Regiment.
Captain R. H. Pigou, Queen's Own Royal West Kent Regiment.
2nd Lieutenant G. G. M. Batchelor, K.O.S.B.
Major L. D. Gordon-Alexander, West Yorkshire Regiment.

ROYAL AIR FORCE.

Flight-Lieutenant J. C. Barraclough, R.A.F.
Flight-Lieutenant A. R. Wardle, A.F.C., R.A.F.
Squadron Leader W. B. Farrington, D.S.O., R.A.F.
Group Captain R. H. Verney, O.B.E., R.A.F.
Flight-Lieutenant H. E. Searle, R.A.F.

Members joining in October.

The attention of potential Members is invited to the fact that if they join after 1st October of the current year, they are not called upon for any further subscription until January, 1932.

Special Facilities for Junior Officers.

The special attention of Members is invited to the new Bye-Law governing the entrance of Junior Officers to the Institution, which was passed at the last Annual General Meeting. The terms are as follows:—

"Commissioned Officers of the Home, Dominion, Indian and Colonial fighting Services and their Reserves, of three years or less seniority as such; Midshipmen, R.N., R.N.R. and R.N.V.R.; and Naval, Military and Air Force Cadets, shall be admitted to Membership without Entrance Fee on payment of the first annual subscription of £1 5s.

"In all cases eligibility for such Membership shall be governed by para. 1 of Chapter 2.

"An Officer who is admitted without entrance fee and who subsequently fails to pay his annual subscription regularly or resigns, shall not be re-admitted without payment of such fee, notwithstanding the fact that he may, by virtue of his rank or seniority, be otherwise eligible for such concession.

"Officers joining under this Bye-Law will date their Membership from 1st January of the year in which they join. They shall not have the privilege of becoming Members in October and of paying no subscription on the ensuing 1st January."

Gold Medal Essay Competition, 1930.

The following essays have been received :—

"Consuetudo pro lege servatur."
"Observer."
"Experientia docet."

Gold Medal Essay Subject (Naval), 1931.

The following is the subject which has been selected :—

"Discuss the forms of attack to which British sea-borne trade is most likely to be exposed in the event of war with one or more European Continental Powers and indicate the lines on which defence should be developed in order to meet such attacks, having regard to existing International limitations of armaments."

In connection with these Competitions the Council have decided that, in future, essays will be adjudicated on their general merits, and the expression of views which do not conform strictly to generally accepted opinions will not necessarily be considered to detract from the value of an essay.

Gold Medal Recipients - Erratum.

In the list of Recipients of the Gold Medal published in the May number of the Journal, the name of the Captain, P. H. Colomb, R.N., should be shown for the year 1877.

Programme of Lectures.

The Programme of Lectures for the 1930–31 Session has now been sent out. Any Member who has not received a copy is requested to communicate with the Secretary.

JOURNAL.

Copies of the Frontispieces.

A limited number of copies of the coloured Frontispieces, published in recent numbers of the JOURNAL, are available for sale and can be supplied, post free, for 1s. 6d. each ; 2s. 6d. a pair ; 3s. 6d. for three ; or 5s. the complete set.

Price of Journal to Non-Members.

The price of the JOURNAL to Non-Members, as from February, 1927 number, is 7s. 6d., or the four quarterly numbers will be sent for an annual subscription of £1 10s. ; post free in either case.

Trade Discount.

Recognised firms can now be supplied with not less than one dozen copies of the JOURNAL at a time, at a wholesale price of 7s. each copy, the buyer to collect from the Institution.

Additional Copies of the Journal.

Additional copies of early numbers of the JOURNAL, if available, can be supplied, post free, to Members at :—

3s. for JOURNALS prior to February, 1927.
4s. for the JOURNAL of February, 1927, and later.

MUSEUM.

Regimental Badges and Buttons.

It is desired to complete the Institution's collection of Regimental Badges and Buttons, including those of the Regular units, Militia and Volunteers.

Members who can make contributions to the Collection are requested to communicate particulars to the Curator, who will inform them whether the Badges or Buttons offered are already in the Collection.

The thanks of the Institution are due to the following Members who, in response to this notice, have already contributed to the Collection :—Major-General John Campbell, the Rev. G. Hawkes Field, Captain H. Bullock, Captain H. M. McCance, Mr. N. A. H. Budd, Major N. Dickinson, Major A. Butler, Captain T. W. Doke, Major E. R. Cooper.

Collection of Medals.

The Institution having had to surrender the Cheylesmore Collection of Medals at the request of the Trustees, the Council are desirous of forming a new collection which will be a permanent feature in the Museum. The Institution already possesses a large and varied collection of medals which are being grouped together, but offers of additions to the collection will be most welcome. Details of such offers should however be communicated before medals are sent.

Portrait of Nelson.

The Museum Committee are anxious to acquire a good portrait in oils of Admiral Lord Nelson.

Additions.

(8339) Union Jack flown during the seige of Kufah, Mesopotamia.—Presented by the Officers of the 3/4th Bombay Grenadiers.

(8340) Two drums of the 9th Sudanese Regiment—disbanded.—Presented by the Officers of the 9th Sudanese Regiment.

(8341) Model of the 10,000-ton cruiser : H.M.S. " London."

(8342) Sword of the Hart's Volunteers, 1800.—Presented by Captain R. A. Coates.

(8343) Collection of medals of the Green Howards.—Presented by Lieutenant-Colonel M. L. Ferrar.

(8344) Foresight and backsight taken from a gun in the Redan, Sevastopol, in 1855.—Presented by M. Cundy, Esq.

(8345) Collection of badges.—Presented by Major A. J. Bandell.

(8346) Two steel plates engraved to serve as pocket map and key for use whilst reading the news of the war in the Crimea.—Presented by C. W. Smith, Esq.

Attendance.

The amount taken for admission during the past Quarter was :—

£327 6s. 0d. in August.
£227 16s. 0d. in September.
£168 10s. 6d. in October.

Purchase Fund.

This Fund has been opened to assist in the purchase of new exhibits. The Council hope that it will receive the support of Members interested in the Museum.

	£	s.	d.
Balance in hand	22	13	3
Sum voted from General Account	100	0	0
	123	13	3
Purchased—			
Model of H.M.S. " London "	75	0	0
	£47	13	3

CENSUS OF REGIMENTAL COLOURS.

As announced in the last number of the JOURNAL, it has been decided to compile a Census of Colours, Standards, Guidons, Trumpet and Pipe Banners of all branches of H.M. Land Forces, including Regular Troops, Militia, Yeomanry, Territorial Force or Army, as well as of Fencible and Volunteer formations of the past, and of the Royal Marines. The success of this project must depend on the co-operation of voluntary supporters. Members and others interested are asked to volunteer as representatives, either of a particular regimental unit, or of a district or area.

On being registered these representatives will receive a supply of cards stating the exact particulars which they are asked to fill in. When completed, the cards should be returned to the Secretary of the Royal United Service Institution, and the envelope marked " Colours " in the top left-hand corner. They will then be filed until sufficient information has been collected to warrant further utilization.

The ultimate object is to publish the Census in volume form, but this again must depend on the requisite financial support being forthcoming.

It is particularly desirable that, whenever possible, cards should be accompanied by a good photograph of the Colour or Standard, as it exists to-day. To be of value this must show the Colour extended and not hanging in folds. The following, in addition to those whose names appeared in the August JOURNAL, have been good enough to volunteer their services :—

	Regiment or District
Lieutenant-Colonel C. W. Grover ..	The King's Own Royal Regiment.
Gentleman-Cadet P. A. G. Glyn ..	Eton College Rifle Volunteers.
General Sir H. E. Blumberg	Royal Marines.
Major Goold Walker	Honourable Artillery Company.
Lieutenant-Colonel R. B. Crosse ..	The Armagh Militia.
Lieutenant-Colonel W. H. Besant ..	The Norfolk Regiment.
Brigadier-General Massy Lloyd ..	West Suffolk Militia.
Colonel H. W. B. Thorp	K.O.Y.L.I.
Captain H. N. Edwards	Queen's Own Royal West Kent Regiment.
Professor J. H. Wardell	County Clare and Limerick.
Colonel W. G. Stonor	Glasgow.
The Adjutant, Royal Military College, Sandhurst	Royal Military College, Sandhurst.
Major L. H. Torin	K.S.L.I.

DECISIVE CHARGE OF THE LIFE GUARDS AT WATERLOO

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[Authors alone are responsible for the contents of their respective Papers. All communications (except those for perusal by the Editor only) should be addressed to the Secretary, Royal United Service Institution.]

THE ARMY AND THE PROPHETS

By BRIGADIER A. P. WAVELL, C.M.G., M.C.

ARMIES must, in the nature of things, change and develop very slowly during peace, since they have always to be ready for action, and can never discard a weapon, an organization, or a tactical doctrine till a new one has been proved by long and careful experiment. Even then, financial limitations will often forbid the adoption of some arm or organization recognized as desirable. With the increasing agitation for disarmament this financial brake on military progress has become a four-wheel brake. The fable of Minerva springing fully armed from the brain of Jupiter shows what advantage gods possess over mortals in short-cutting the usual channels and normal period of gestation for military projects. The problem which faces the reformer of armies in peace might be likened to that of an architect called on to alter and modernize an old-fashioned house without increasing its size, with the whole family still living in it (often grumbling at the architect's improvements, since an extra bathroom can only be added at the expense of someone's dressing-room) and under the strictest financial limitations.

Meanwhile military thought and ideas of all kinds (" lucid, average, incoherent," as A.F. B. 194 would put it) are being poured forth, far ahead of the possibilities of re-organization and re-equipment. The following discussion makes no claim whatever to originality, but represents an attempt to discover the general tendencies of military organization

since the war, and to state what seem to be the logical results of the present military theories and inclinations as set forth by the best of the military writers, particularly as these theories affect the peculiar problem of the British Army.

The principal factors that faced the makers of armies at the end of the war may be summed up as follows:—

(*a*) The movement of unarmoured men on the battlefield in the face of machine gun fire had become so costly in casualties, that the assaulting power of infantry had been reduced almost to vanishing point.

(*b*) Two methods of redressing the balance against the attacker had been evolved; the one was by a great increase of artillery fire-power to neutralize the fire-power of the machine gun, the second was to combine fire and movement in an armoured vehicle, made possible by the entry of petrol into warlike uses. Speaking broadly, the first may be termed the French, and the second the British answer to the problem.

(*c*) The progress made in aviation had introduced into warfare an entirely new factor, and a new dimension. This was also due to the discovery of petrol, the greatest solvent of previous methods of war since the invention of gunpowder.

(*d*) The use of poison gas had increased the complexities of war in several ways, and opened up possibilities of far-reaching developments, which the average soldier viewed with distaste, disliking the prospect of having to include chemistry in his already motley trade.

(*e*) Not only had the whole civil population and the whole industrial strength of a nation become involved in a war of any magnitude, but it was also clear that in a prolonged struggle industrial power was going to be a surer aid to victory than mere numbers of armed men. The fate of Russia was an illustration of this fact.

Actually, the end of the great conflict was followed by a reaction against war and by a refusal on the part of governments to consider any military problems except the most immediate, such as the garrisoning of occupied enemy territory or overseas possessions and the provision of a force for internal security. These called for considerable numbers of armed men, but not necessarily for a high degree of technical efficiency or scientific equipment.

Two other considerations influenced the strength and composition of military forces after the war. The first was, of course, financial stringency, all available funds in an almost bankrupt Europe being needed for civil reconstruction. The second was that military administrators stood too close to the event to judge clearly of the lessons of the war; a period of assimilation was necessary before the true teaching

of the war could be seen. In the result, post-war armies came to differ from those of 1914 in detail rather than in principle. The fire-power of the defence was augmented by a still further increase in machine guns, which has rendered the problem of offensive movement still more difficult. Yet the unarmoured foot soldier remained the framework round which the whole organization was built; and the aim of post-war developments was rather to contrive means of restoring to the foot soldier movement in the face of modern fire-power than to find any substitute for him as the assaulting arm on the battlefield. Much effort has been directed towards making the artillery support of infantry closer and more effective. The proportion of artillery to infantry has, however, generally been reduced, for reasons of economy, from that obtaining at the end of the war. The proportion of cavalry has also been reduced in all armies, since aeroplanes and armoured cars have taken over a large part of its reconnaissance duties, and fire-power has rendered its intervention on the battlefield too costly. Tanks have been developed as a support to the infantry rather than as a separate arm, and their cost has kept their proportion low.

The most noticeable feature in conscript armies since the war has been the shortening of the term of service. The average period of training with the colours has been reduced from the pre-war three years to one-and-a-half, and in France to one year. This means a very considerable lowering of efficiency. No high degree of manœuvre or mobility can be expected of such armies on mobilization.

If two armies of the type indicated above, composed primarily of infantry, moving at infantry pace, with little training or capacity for manœuvre but almost unlimited capacity for delivering a stream of bullets, were to meet at the present time, there can be no doubt that the fighting would become stagnant almost at once. The French indeed seem to admit this, for their battle procedure is based on almost complete reliance on artillery fire for progress, and they recognize that advance will be very slow.

Aircraft have increased, and are increasing, in speed, range and efficiency; and their use for travel, sport and commerce is continually growing. But it cannot be said that the problem of their strategical combination with the older arms and services has been solved; and the relative value to be set on the air arm in future warfare has been hotly debated, though its great power as a long range weapon has not been called into question. The example of Great Britain in forming an entirely independent Air Force has not been generally adopted by the other nations, though Italy—and lately France—have taken certain steps in this direction.

The fact that gas was officially denounced as a weapon of war at the Washington Conference in 1922, and that the five nations represented at the Conference agreed not to use it, has, naturally, hampered progress in its development as a scientific weapon. Until this ban is lifted, little progress is likely, though all the principal armies maintain experimental establishments to study gas as a weapon. Its potentialities and its limitations can be read in " Callinicus " by Professor J. B. S. Haldane.

These two new factors in warfare, the air arm and gas, may be said, therefore, to be only partially explored, and to offer great possibilities for further theory, experiment and exploitation. But on one of these lines of exploration popular sentiment has set up a notice " Out of bounds to troops." All nations realize that this notice is likely to be disregarded in a crisis, but none cares openly to announce its intention to do so, except Soviet Russia, whose backward state of development makes it least likely to use the weapon with effect.

The preparation of the whole national strength for war is probably the factor in which greatest progress has taken place since the war. In practically all countries the subject has been studied in great detail, and schemes have been prepared to mobilize on the outbreak of war not only the naval and military forces, but the factories, the Press, and almost every branch of national life.

In the last few years experiments have begun in the production of so-called " mechanized forces," which do hold out some hopes of restoring to armies, freed from the dull obsession for mere numbers, full play for manœuvre in the open field. Briefly, the idea that inspires these experiments is to develop the tank as the principal fighting arm, to which infantry and the other arms will form auxiliaries as required, instead of making the tank, as heretofore, an auxiliary to the infantry arm. It is no new method of warfare but the regeneration of an old one : the tank used on these lines is the re-incarnation of the Gothic horsemen who gave the Roman legion its death-blow at Adrianople in 378, of the knight in armour of the Middle Ages, or of the heavy cavalry of the XVIIIth century. Mechanized forces, in armoured vehicles, are not yet realities of war ; their difficulties and limitations will be discussed later. But on the success of this experiment seems to depend at present the hopes of mobile instead of trench-bound warfare.

Such has been the development of armies since the war. It is proposed now to examine the general trend of current proposals for military reform, and then to consider how far such ideas are practicable and likely to be carried out.

The views of some of the best known military writers who have

published their reflections on the late war and their recommendations for the future[1] may be summed up somewhat as follows:—

The theory of numbers failed in the late war, and any future attempt to succeed by weight of numbers must end in failure or stalemate; it is no use exposing masses of unarmoured earth-bound men to ruthless machinery. The armies of the future must be protected by armour and must be highly mobile; they will, therefore, be small. Only machines can beat machines, therefore victory will be to him who can produce the most and the best war machines and munitions in the shortest time.

The late war was meant to be short and to be decided by numbers of men, therefore the economical preparation was insufficient. And the soldier, through lack of preparation, failed to make the best use of all the resources of civil life when they were placed at his disposal. But in the next war industrial mobilization—the conversion of the whole civil population, factories and resources to the purposes of war—will be a predominant feature. This mobilization of means will not be a matter of days, as was the mobilization of men in 1914, but of months; and the contending nations will make every effort to stop or hamper the mobilization of their adversary. Bombing by air forces (including the use of gas bombs), the action of small mobile armies and subversive propaganda will be the chief weapons used to delay or prevent the development by the enemy of his full resources. Therefore the chief centres of industry will require a highly organized system of defence against attack by air, by land and by mental suggestion.

The picture that these prophets give us then is this: the first forces engaged on land will be comparatively small, highly mobile bodies, and in the air every available machine, military or civil. Meanwhile the whole machinery of civil life is being harnessed to military uses. Victory will go to that nation which can soonest establish superiority of production in war machines or can most effectively cripple the life and will of its enemy. If this vision is to be accepted as a reasonable forecast of a future war between two highly-developed states, we must embark on a further stage in our examination and discuss the organization of armies (including air forces) appropriate to such a conception of war.

Military progress follows civil progress, though at a considerable distance. Petrol has been altering the whole pace and range of civil life for more than twenty years, but war on land still proceeds at foot pace. The mechanization of armies, though gradual, is, however

[1] See for instance "On Future Warfare," by Colonel Fuller; "Paris, or the Future of War," by Captain Liddell Hart; the writings of the German General Von Seeckt.

inevitable. It may be divided into three stages: administrative, strategical and tactical. The administrative stage, placing the rear services on a mechanical instead of a horsed basis, was practically accomplished during the late war; but the change made no increase in the speed of military movement, it only served still further to clog the battle line with more men and heavier material. Strategical mechanization, that is the movement of large bodies of troops in mechanical vehicles to a position of strategical advantage, on reaching which they disembark and fight on foot, was but little practised in the late war, except as a means to move reserves to a threatened point. Its possibilities have been explored and to a certain extent developed since the war; the mechanization of first line transport of units is a step which would increase the effectiveness of this use of mechanical vehicles. One great stride remains to be taken both by administrative and strategical mechanization, that is the transition from a road-bound basis to a cross-country basis. Not only will this confer a greater freedom of action and a better chance of surprise, but it will make it more difficult for the opposing air force to interrupt the lines of communication. This change is within sight with the invention of the six-wheeled lorry, provided it is extensively adopted for commercial use.

The third stage, tactical mechanization, that is the use of machines to fight from, was inaugurated by the invention of the tank. But it is only lately that experiments have been made to fashion an entirely mechanized and armoured fighting force. With vehicles already in use such a force can cover fifty miles in a day and move at ten miles an hour in battle. Machines have already been designed which can double this distance and speed. The power, actual and moral, of such a force, armoured against bullets and proof against gas, is obvious. Its superiority over the normal present-day armies, given a fair field, is overwhelming. But there are certain difficulties and limitations which attend the general introduction of armoured mechanized forces. The first is the technical limitation, the old conflict between gun and armour. Already armour-piercing bullets and specially designed Q.F. anti-tank guns threaten seriously to lessen the value of the tank as an assaulting weapon. And it is impossible to increase the armour-protection of tanks beyond a certain point, since the consequent increase in size and weight would prevent their surmounting the many obstacles found on the earth's surface. It is of little use to build a tank that is too heavy or large to pass over the normal bridge or along the normal road or street. In Great Britain there is the further limitation of transport overseas, since the amphibious ocean-going tank is at present little more than a dream. The conclusion is that armoured machines to fight on land must be designed for speed and fire power rather than for armour and

bulk. That speed is often a better protection than armour can be instanced throughout military history.

A second main difficulty, so far as conscript armies are concerned, is that of the personnel to man these forces. The machines will require a crew of highly trained specialists, such as cannot be provided by the shortened period of training in national armies of to-day. In fact a mechanized army seems inevitably to demand a professional long-service army. A nation like France is unlikely to accept such a radical change in her military organization until events or conditions force it on her. Not only does a professional army mean heavy additional expense, but it entails the breaking of long years of tradition. There is a feeling, too, amongst Continental nations with long land frontiers that numbers of men are still essential for defensive purposes. Therefore the armoured or mechanized force is likely to reach development first of all in countries with small professional armies such as Great Britain and the U.S.A. It will be curious, too, if France, for the second time in history, will be found to have forced on Germany, in the effort to limit her military strength, a military organization more readily adaptable to the needs of the future than her own.

The third limiting factor in the growth of mechanized forces is that of terrain. Such forces will always be more susceptible to difficulties of ground than normal forces, and will be quite unsuited to certain types of ground, such as mountains, forests or marshes. For such regions troops trained to fighting on foot will still be required. But since all great civilizations have established their main centres in open plains, decisive battles will usually be fought in those plains and fighting in mountains or forests will be subsidiary. Mechanized forces must, however, be provided with ample means for the ready passage of rivers.

The general conclusions drawn are that in the gradual process of mechanization a time will come when fighting in the open field will be done principally from machines; that such machines will have to rely for their protection on their speed rather than on their armour; and that the personnel to man them will require a degree of skill only to be attained in a long-service professional force.

There will, however, always be a necessity for a proportion of lightly armed highly trained soldiers, who will fight on foot though transported to the scene of action by land or air machines.

This evolution is even now proceeding. Administrative mechanization is already an accomplished fact: the R.A.S.C. of the British Army at home, for instance, has no longer any horsed unit. The next step lies in the general adoption of a cross-country lorry. The tractor is replacing the horse as a means of drawing artillery, a process which

will continue till all artillery is mechanized. In the Engineers not only the means of traction, but also the tools themselves are being mechanized. Armoured cars are taking over much of the reconnaissance work of cavalry, in which arm the machine is partly displacing the horse. Infantry will remain, since a force that can fight on foot will always be required in certain terrain. But infantry will not march to the battlefield, but will be transported in a cross-country motor vehicle or perhaps at times by air. The mechanization of what is now their principal arm, the machine gun, is already in the experimental stage. It must again be emphasized that the whole transition will be very gradual. With it there will also come a certain change in the habits and discipline of an army. The tending of machines, with the higher standard of intelligence which it entails, undoubtedly breeds a spirit of independence that will not endure too rigid a discipline. The psychology of a mechanized army is a subject that has yet to be studied.

A change in organization which seems likely to be a logical outcome of the substitution of machines for men is that the brigade will become the smallest formation of all arms instead of the division. The first indications of this change were already apparent towards the end of the war.

To turn to the evolution of the air arm. On the purely military side, that is to say in the air squadrons maintained for co-operation with land armies, there has been comparatively little change since the war. There have been many technical improvements in the design and performance of aircraft and especially in the means of communication between ground and air. But the principal tasks demanded of these squadrons—reconnaissance, artillery observation, air fighting, attack on troops and bases—were all originated and developed before the end of the war. Two further uses of aircraft have been the subject of experiment since the war and may eventually prove of some importance. These are the employment of large aeroplanes, either as troop-carriers or for purposes of supply. The former expedient may enable a small body of troops to be rapidly conveyed to the scene of some local disturbance and thus be of considerable value in the police work of armies; but whether it can ever be applied on a sufficient scale for strategical or tactical purposes in a great battle is doubtful. A fleet of flying tanks landing behind an enemy and then shedding their wings and attacking him in rear is an inviting dream but not likely of fulfilment for a long time, if ever. Supply by aeroplane may become of especial importance to mechanized forces with their long range of action. A sufficient number of large size aeroplanes may, however, rarely be available for either of these uses—in view of the value of such aeroplanes for bombing.

It is when we come to the independent use of the air arm for attack on objectives in the heart of the enemy country that we enter on the most difficult and controversial part of our enquiry. On the one hand, we have the claims of those who hold that the aeroplane has rendered all armies obsolete, and that future wars will be decided almost solely by air action; and on the other, those who point to the comparatively small effect of air bombing in the late war, to the greatly improved accuracy of anti-aircraft fire, to the vulnerability of aeroplanes, and to the enormous wastage in aircraft that long-distance bombing causes, even without the casualties due to the action of the defender. There is no space here to debate this question, it will suffice to summarize the main conclusions as to the future use of aircraft in war:—

(*a*) Since, as already pointed out, the race for industrial mobilization may be decisive of a war, the importance to a nation of the development of its civil aviation is obvious; only so will factories and plant be available for the necessary expansion of the air arm.

(*b*) Just as land forces cannot produce their full power without the assistance of the air arm, so the air arm is dependent on ground forces for the protection of its aerodromes. The closest co-operation between air and land forces is therefore essential. This co-operation is undoubtedly easier where the air squadrons form an integral part of the land force, as in most continental armies.

(*c*) On the other hand, the British system of a separate air force is favourable to technical development.

The intense mobility of the principal offensive weapons of the future, mechanized forces and aircraft, will lead to a necessity for the defence, not only of the bases, depots and aerodromes of the fighting forces, but also of the chief centres of government and industry in a nation. This defensive organization of a country will undoubtedly absorb large numbers of troops and a considerable amount of material. Guns will be the principal weapon of the defence, small high-velocity guns for use against armoured vehicles and anti-aircraft guns for use against air attack. Other devices will also be employed, such as obstacles and mines, against land machines, searchlights and aprons against air machines. The air attack will also be met by squadrons of fighting aeroplanes, briefed for the defence. The defensive troops will need neither so high a degree of training nor such mobility as first-line fighting troops.

Let us now sum up the general conclusions arrived at and then, finally, consider how such changes would affect the particular problems of Great Britain.

In the first place, a change in the whole nature of war has to be recognized. In the past, armies have, at the beginning of hostilities at any rate, been able to interpose as a shield between the enemy and the nation; with the invention of the aeroplane and the prospective mechanization of land forces this is no longer so. The whole life of the nation may be exposed to shock from the outset, even on an island. Again, mobilization formerly concerned only a limited proportion of the population—it was even possible to adopt such a slogan as "Business as usual" for the remainder; in future the mobilization of practically the whole nation and its resources will begin at once. Hence soldiers as well as statesmen will need to study carefully the civil organization of their countries, the morale of the average citizen, the needs of home defence. To give only one instance, it may possibly become necessary to issue means of protection against gas to the population of a large area.

As to armies themselves, masses of unarmoured men have ceased to have any offensive power. First-line troops, intended for offence, must be mechanized and armoured. As mechanization is expensive and demands a high standard of training, first-line forces will tend to become small and highly specialized. These forces will include a proportion of troops trained to fighting on foot in terrain unsuitable for the free movement of mechanical vehicles. Behind the first-line army will stand a large defensive organization, based on national service.

Overshadowing war on land hangs the unproved, incalculable menace of the air arm. Though many of the claims made for it are exaggerated and unjustified, its influence is growing rapidly. So that the development of civil aviation in peace is one of the provisions most likely to lead to success in future wars.

It may be observed that the strategy of mechanized forces will have much in common with naval strategy in its independence of fixed lines of communication and dependence on securely established bases; while, tactically, mechanized forces will be handled much on the principles that guided cavalry. A study of naval strategy and of the exploits and precepts of the great cavalry leaders is, therefore, recommended to those who aspire to high command in a future war.

In the formation and evolution of mechanized armies Great Britain has certain distinct advantages: firstly, in the constitution of her army, since a long-service professional force enables the required standard of training to be reached; and secondly, in her possession of a highly-organized mechanical industry. Since the invention of the tank she has led the way in the development of armoured forces and of their tactics, and has every chance to maintain this lead. Her regular army at home and abroad may eventually develop into a highly mobile force, of which

the greater part will fight from armoured vehicles, but a portion will consist of light troops trained to fight on ground unsuitable for mechanical vehicles. The second line—the Territorial Army and the local forces in the various colonies—may be mainly organized for defensive duties. Dominion armies are also likely to be organized principally for defence, but may maintain small armoured forces.

As regards the air arm, Great Britain has serious disabilities to overcome. Her chief centres of government and industry are exposed and difficult to protect, and a small island with a highly-organized railway and road system is not favourable to the development of civil aviation. This disadvantage will, however, be counterbalanced as the range and capacities of aircraft increase, if long-distance air routes are established to the outlying portions of the Empire. These will lead to the creation of fleets of the most powerful type of passenger-carrying aircraft, which should be of great assistance to the swift policing of the Empire in a minor emergency, and in a great war could rapidly be converted into bombing planes. Therefore the importance of linking up the Empire as soon as possible by a chain of long-distance air routes cannot be over-emphasized.

AEROPLANES AND ARMIES

By Air Commodore C. R. Samson, C.M.G., D.S.O., A.F.C.
R.A.F. (Retd.).

THE aeroplane as a means of offensive against ground troops and their maintenance services requires far more serious consideration than seems to be accorded to it at present. The recent Army manœuvres, for instance, leave the impression that if either side had been exposed to the attack of even so small a force as four squadrons of modern aeroplanes, the issue would have been seriously affected. In the course of the exercises most attractive targets for aeroplanes were noticeable; typical of such was a headquarters formation halted on a road, which did not make the slightest attempt to seek cover for at least half an hour; large convoys of mechanical transport climbing Amesbury Hill in close order; and a motor battery proceeding across the open plain in an order that offered an ideal target for single-seater fighter attack. Perhaps in the general scheme of these manœuvres all consideration of an air offensive had been purposely eliminated; but they certainly left the unofficial observer with a strong impression that modern armies provide ideal targets for aeroplanes.

Aeroplane attack upon troops proved successful during the Great War on two specially noteworthy occasions, namely during the Bulgar retreat, and in the retirement of the Turks in Palestine. In addition, one may recall the work of the Royal Naval Air Service in Gallipoli, which forced the Turks to abandon all supply movements by day, both along the roads and at Ak Bashi Liman.

The mechanization of the Army has changed its tactics to a certain extent; but far greater will be the change that must follow the employment of aeroplanes for what, in the war, was sometimes termed "ground strafing." Surely it must be accepted that large bodies of troops, who either fight in, or are conveyed to, the scene of action in motor vehicles, provide better targets for aeroplanes than do marching infantry. It is obvious that an embussed formation cannot scatter and seek cover like infantry on foot. Actual war experience of attacking both types of targets must lead one to a preference for attack of the mechanized column.

Before investigating the various methods of attack which can be employed, it is as well to discuss several important points in connection with modern aeroplanes, since a study of certain features of really modern aircraft will demonstrate clearly that air attack cannot be judged to-day by the standards of what took place in the late war. Firstly, few of us even now realize the gigantic progress that designers of both aeroplanes and aeroplane engines have made as a result of the Schneider Cup races. The improvement during the last two years has been far beyond the previous average annual advance. In simple language, we have now discovered how to obtain speed. A glance at a weight-per-horse-power table shows that modern engines are of extraordinary lightness in comparison with those of a few years ago. This means more carrying power, better climb, and, to a certain extent, higher speed. As an example it may be stated that in the Royal Air Force to-day there exists a squadron equipped with aeroplanes of the so-called day bomber class that can fly at something approaching 200 miles an hour. In addition to their straightforward performance they can be used for low attack work; those who have practised against the 140 mile an hour Siskin will appreciate the added difficulty of bringing down a 200 mile an hour newcomer.

For many years while employed in a single-seater fighter command I attempted to discover the tactics that could be employed against day bomber formations. Reluctantly I came to the conclusion that the day of the single-seater fighter was past, except perchance when in combat against its own kind. This opinion is now shared by others, and consequently it would seem possible to assert that in land operations undue reliance upon local air superiority is likely to be a snare. Moreover, even if the single-seater fighter still be regarded as being to some extent a menace to the bomber, yet the high speeds of the present day render contact, and the resulting aerial combat, far more difficult to obtain. The day of the lone aeroplane may perhaps have come back, and conversely, the need of formations for the penetration of the enemy's line may have passed. If this is so, then aeroplane attack upon ground forces will become more persistent. Low converging attack by single-seater fighters was based on the slow speed of the aeroplanes. The present writer was personally implicated in the evolution of this form of attack, consequently he may assert that if we had possessed faster aeroplanes, low converging attacks would never have been encouraged. High speed means less voyage time and greater frequency of attack, and, it may be urged, also less exposure to interference both from the air and from the ground. The money spent by the Air Ministry on the Schneider Cup preparations has been money well spent, and those who authorized its expenditure are deserving of our gratitude, although that same feeling may not be shared by the anti-aircraft gunner.

Forms of Attack.

Let us now consider what are the actual forms which attacks from the air against ground forces may take :—

(1) *Attack of large armoured vehicles*—At present the bomb and the machine gun are the aeroplane's only weapons. The bomb, if it hits a tank, even of large size, will put it out of action, but the accuracy of bombing has not yet reached a state where a high percentage of hits can be expected against a target even as large as a tank, which offers a target area of four hundred square feet. The machine gun will not exercise any appreciable effect on the large armoured vehicle.

We must, therefore, turn to the weapon that can offer both accuracy and hitting power, that is to say the gun. Gun-carrying aeroplanes were evolved in 1913, but little progress has been achieved since then. Without doubt it is possible both to produce an efficient tank-stopping gun, and an aeroplane to carry such a weapon. Once this has been accomplished the armoured fighting vehicle will have a redoubtable enemy to encounter, and it is difficult to see how it could operate in day time in open country, if the enemy should possess many gun aeroplanes. There is, of course, a counter to this attack, as there is to any other weapon. Herein may be found the role of the single-seater fighter, since the gun aeroplane must sacrifice speed and defensive armament in order to carry its ordnance and ammunition. This condition will entail a close co-operation between tanks and fighter squadrons, and it really seems that we shall have to attach a single-seater fighter squadron to a tank company and let them work out the problem. Perchance the perfect antidote may then be discovered.

(ii) *Attack on small armoured fighting vehicles.*—This can be carried out with the bomb and machine gun. The bomb, however, must be of a different pattern from what is now in general use. The large high explosive bomb means low magazine capacity, and consequently spasmodic attack, although it possesses the advantage of large danger area. The small high explosive bomb has the advantage of large magazine capacity, but depends on direct hits to obtain results. The machine gun may suffer from lack of stopping power, especially as the small land fighter, following the lines of the armoured car, will probably have complete armour protection. The suggested weapon is one which will consist of a number of containers in the aeroplane, each loaded with about twenty high explosive bombs of about 8 lb. weight. On pressing the trigger the bombs will drop in groups of five, with only a momentary interval between the groups ; thus a good pattern will be obtained, and direct hits should be possible. Tests will be required to arrive at the correct size of bomb. The type of aeroplane for this work will be the day bomber.

Now the defence against this form of attack is, as previously shown, a difficult problem. That it may resolve itself into some form of ground system seems likely, and anti-aircraft vehicles suitable for working with armoured fighting vehicle formations, and which can fire whilst in motion, should be experimented with.

(iii) *Attack on transport.*—Here the heavy bomb has its uses, also the machine gun, but it is still suggested that the container loaded with little bombs possesses great advantages, as also the gun aeroplane. Transport, both mechanical and horsed, must travel in such formations as experience has proved to offer the most difficult targets for aerial attack. Unfortunately, the best defensive formation will probably be the most difficult to maintain. The question needs to be studied thoroughly from all angles.

A mechanized army will march and fight, not so much on the stomachs of its soldiers, as on the petrol tanks of its motors. In times past the British soldier may have eaten his boots and won a battle, but the internal combustion engine cannot fight on an empty petrol tank. A breakdown in the petrol supply service will spell instant disaster. It therefore seems that the opposing commanders will largely base their plans on intensive attack upon the supply depots, and leave the convoys untouched, unless they have at their disposal vast numbers of aeroplanes.

With the high speed of the modern bomber, and its ability to reach its objective and attack in visibility of a low order, nobody could be so bold as to guarantee adequate protection for a depot; a petrol depot, moreover, is one that is easy to destroy with a mixture of high explosive and incendiary bombs. The defence, therefore, has only one course to adopt, namely to have recourse to a system of underground stowage and dispersal of tankage. Far-fetched as it may seem, there may yet be scope for mobile excavators attached to every supply depot, while the question of armoured petrol tankers may be worth consideration.

One type of aeroplane remains to be mentioned; that is the co-operation type. Whether in the future there will be a call for such an aeroplane seems doubtful, since so much is demanded of its design that the result can only be an inefficient aeroplane: a jack-of-all-trades and master of none. The Army of the future will require co-operation from every aeroplane, and several different types may be required, although standardization must not be overlooked. For instance, the "Hart" could act for both bombing and contact work. Each arm seems to require the services of aeroplanes, yet the work required from them differs in every case. Artillery needs an aeroplane that can direct its fire and locate targets; tanks demand aeroplanes that can protect them from gun-aircraft, lay smoke screens, carry out reconnaissance and

act as an ammunition supply column, also perhaps work as fuel supply units. In this connection the aerial transportation of fuel for all mechanical formations is well worth consideration and experiment.

The more one attempts to visualize warfare in the future, the more likely does it appear that it will tend to become like naval combat; that is to say sudden contact, followed by rapid and decisive results.

Two further points require consideration: (1) the control of the armies; (2) the need for aerial assistance to every ground unit.

Control can only be achieved when a commander of an army is in the same personal touch with the situation as is a commander of a fleet at sea. Therefore the question of a commander using an aeroplane must not be simply dismissed as a wild idea. The subject is at least one deserving trial.

As regards the second point, the need for continuous experiment to arrive at some conclusive data is urgent. The Royal Air Force is very fully occupied, and the difficulties in the way of detailing squadrons for this work are fully realized. Yet it is obvious that a mixed squadron experimenting with a force of all arms should be able to obtain much valuable information for both Services, especially if the combined force were to be moved from one area to another in order to work over different types of terrain.

Two years to be devoted to experiments carried out by the same personnel, but using such various types of aeroplanes as experience may dictate, would seem no unduly great effort or expense in view of the importance of the problems involved.

THE ARMY EXERCISES OF 1930

By Captain Liddell Hart

ONE general certainly increased his reputation in the exercises of 1930: General Rain. He showed a genius for striking at the crucial moment, a malevolently inspired *coup d'œil* which other generals might justly envy. And unfortunately like certain famous generals of the past, he seemed to have a jealousy of possible rivals, which made him uncannily alert to forestall and frustrate other generals.

This year he was unique in the decisiveness of his strokes. He even performed the " hat trick." For, by curious coincidence, he submerged in turn the final exercise of the 4th Guards Brigade, of the 2nd Division, and of the combined Aldershot and Southern Command troops on " the Plain." The consequences were the more disastrous because each of these exercises gave promise of being the most interesting of their respective series, a promise that was never fulfilled. In the first the South Downs were metamorphosed into foot hills of the Himalayas for the purpose of trying out new methods in frontier fighting. The advance of the punitive force, under Colonel C. P. Heywood, followed the method of picketing the heights on either flank, but it also had a flavour of the Napoleonic method, for it was made in an elastic grouping of three columns, any one of which could take care of itself while the others pursued the commander's design. On the other side there was the exhilarating original spectacle of guardsmen turning themselves into guerillas and applying Lawrence's axiom that for such warfare the normal principles of war should be inverted. One has long been convinced that a periodical course in guerilla tactics might do much to develop the present rather drab standard of infantry tactics in the British Army. While machine guns were entrusted with the defence of the menaced village, the riflemen were assembled at a central point where they lay hidden in the woods, while mounted patrols located the route of the enemy force, and particularly of its convoy of ox-wagons. Their orders were to avoid combat, and instead to strike either at the convoy or at the person of the enemy commander. And in their hornet-like flank to flank attacks, they were neither to pause nor to withdraw the same way, but to race on for a mile or so, rally, and come back to repeat the process at a fresh point.

In the 2nd Division exercise, General Rain's night attack forestalled a night attack by Brigadier Wavell's brigade group. During the day

this had been gradually pressed back northward by General Cubitt's division-minus-a-rib. At dawn the infantry advance was to be resumed, but chiefly as a mask for General Cubitt's real stroke, with cavalry and tanks, against the enemy's lateral railway. The tanks were to start at 5 a.m. on their wide thirty-mile circuit. But the enemy was planning to strike in the dark an hour earlier. Unfortunately the rain timed its intervention still earlier. This was the more unfortunate because the project of such a stroke was a refreshing change from the usual dawn attack and it would have been interesting to see, or at least to hear, its upsetting effect. The consistency of our Army is both its strength and its weakness. If we try a new thing as a surprise, we are apt, in our delight, to continue it as a custom, and so to strip it of surprise. Dawn attacks themselves were originally a means of taking the opponent off his guard. Now it is a real surprise, and relief, to the onlooker if any exercise does not work up to an attack at dawn!

Even more untimely was the fate of the final exercise on Salisbury Plain, for it seemed almost certain that here we should at last see the improvised Medium Armoured Brigade used as a whole, and used in a way suitable to its qualities. General Ready's 1st Division had made a raid to destroy some imaginary mines near Netheravon, and the timing of the scheme allowed him to occupy them before midday. His opponent General Knox, had a new mixed pattern division, comprising two cavalry brigades, one armoured brigade, and one embussed infantry brigade. But the scheme did not allow his armoured brigade to be available until 5 p.m. As he was too late to save the mines, and a direct attack would have been against hopeless odds, he was encouraged to reserve his stroke for next morning; to send his armoured brigade round the enemy's flank by night and strike at them while on the move as they were trying to regain their own frontier.

Thus we might have enjoyed one positive example of the test which this year's chief innovation was devised to produce. In the previous exercises the tanks had been launched so regularly against prepared positions, in nullification of their mobility, that one might almost conclude that, like driven game, they were meant to be shot. If the idea was to produce a battle, it really produced a battue. Where they were not thrown against the strong front of an enemy position, directly along the all too certain line of expectation, they were reserved to throw at the opposing tanks, apparently on the subconscious theory, "let the tanks kill each other, then we can get on with the war."

It was reserved for General Rain to punish these slips. And he allowed no chance of redemption. Through his intervention, the training season was shorn of the ultimately positive lessons in the art of generalship

and in mechanised manœuvre that it might have yielded. To the cultivation of generalship the loss was specially unfortunate, because each of these three schemes put a premium on unconventional methods and incited the commanders to elasticity of plan and execution. To the development of mechanisation, the abandonment of the last exercise, especially, means that we are left for 1930 to reflect chiefly on examples of how armoured forces should not be used and the power of mobility abused.

It is not easy for the observer to focus incidents in the light of real war conditions when exercises have to be carried out on the Government ground at Aldershot and on Salisbury Plain ; areas absurdly narrow in comparison with even the present range of mechanised forces, and further cramped by wire fences and innumerable " Out-of-Bounds " patches. To see a battalion of tanks advancing in a long string over open downland because they were confined to the road by a few strands of wire was a ridiculous sight. It violated the essential nature of tank action, which rests on cross-country movement and wide frontages. Care for such restrictions is often carried to a pitch of both tactical and financial absurdity. On the Timber area one saw tanks waiting to pass in turn through a gate, rather than break through a fence that would have cost a few shillings to repair. Yet, besides offering a bunched target and delaying their manœuvre, they were consuming pounds worth of petrol and oil.

It is to be hoped that when the area is fully acquired, such fences may be removed. Even so, the areas will still be inadequate in extent. The Army at home has no training ground which offers scope for realistic test of and practice for the new mechanised forces. It is a gloomy outlook for our military future. Perhaps the only remedy might be to move these mechanised forces to the vast and sparsely populated areas of central Wales for an annual period of training.

The worst danger of the present limits is psychological. It lies in the difficulty of shaking off such artificial habits, and the cramped ideas they induce, when war comes. In this connection there is an amusing story in General Spears' " Liaison," just published. On arrival near Mons, with the shadow of the German masses creeping perilously close, a message was received from the cavalry to ask " if they were justified in loopholing the walls of a farmhouse. Evidently they thought they were still at manœuvres." In another place the author particularly remarks : " In war . . . the soldier is either too tired or has no time to think ; he will only do what comes to him naturally and instinctively, through long usage." One fears that if war came to our Army, trained under present limitations, much of the value of our mechanised troops,

and of the new mobility, would be forfeited through the shackles of peace-training habits.

Another aspect of peace-time exercises deserves emphasis. Because the executive acts and umpiring decisions are made under artificial conditions, any deduction from them, especially in detail, is largely a matter of individual opinion, of guess work even. Thus it runs more risk of missing truth than does an analytical pursuit of general tendencies and effects. History attests this. Lessons learnt from peace exercises have, indeed, far more often proved false than those of pure theory, developed from logical reasoning and historical analysis.

It would be unfair, however, to argue that the past season's practice yielded no value. A number of points were certainly brought out by actual experience as could not have been done by any other method. One was the relative increase of mechanical endurance, particularly noticeable in the first Southern Command exercise, where the Armoured Brigade followed a sixty-mile trek to Bovington by a fighting advance north to the Avon in which over sixty miles were covered between 3 a.m. and early afternoon. This is the more significant because the machines have been growing older, and so inherently more liable to breakdown. The fact that increase of age has been accompanied by a decrease of casualties, despite an acceleration of marching pace, is a tribute to training ; and it is a vindication of those who argued that it was unwise to base calculations on early performances, and prophesied that as commanders became more mechanically understanding, and their men more mechanically trained, standards would rise, and difficulties grow less.

There was an illuminating illustration of this truth, and of the difference made by experience, in one exercise. A light tank company commanded by an officer who had enjoyed three years' experience in handling these machines attained a remarkably high average pace without incurring casualties, whereas another company under an officer who had just come fresh to the task suffered numerous casualties although moving at barely half the former's average. Of the general improvement there has recently been an even more striking example in Egypt, where five medium tanks travelled a hundred and thirty miles across the desert from Cairo to Alexandria in thirty hours, and eventually, after taking part in exercises, returned to their base through a sandstorm that stopped all other forms of transport.

Among other mechanical impressions of the season has been that of a marked improvement in the work of the armoured cars, and also of the remarkable influence they have sometimes exerted on the opposing command, an influence not perhaps consciously appreciated, yet none

the less dominating. Another significant reflection concerns the visibility of the various arms. One often feels that it is a pity that practical tests of comparative visibility, both for means of movement and formations, are not carried out.

A medium tank, for example, can easily be mistaken, particularly on a misty morning, for a clump of bushes. On most types of ground the visibility of a Carden-Loyd is much less than that of a man on a horse, and of several Carden-Loyds astonishingly less than that of several men on horseback. The former not only merge with the background more easily, but attract the eye less in movement. Unfortunately, by a peculiar absurdity, this asset was dissipated by decorating the tiny machines with red and white distinguishing signs of disproportionate size.

This " advertisement " at least helped to mitigate a danger to the infantry which was significantly emphasized this year by the attempt in the 2nd Division exercise to protect the march of an infantry column with anti-tank guns. Against a mobile opponent their own peril might outweigh their value. For they can so easily be " netted " by light tanks or cavalry patrols—cavalrymen either horsed or mechanized. Such mobile adversaries may catch them unawares from a close-up fire position or, alternatively, dismount and stalk them on foot. Thereby an infantry force which relies on anti-tank guns to picket its march might be stripped of protection without becoming aware of its nakedness.

This consideration brings us to the question of cavalry: a question that is the more difficult because cavalry have become so mechanized with Austin reconnaissance cars, Carden-Loyds, and six-wheelers that they might almost be termed a framework of steel with merely a filling of horse-flesh. Viewed logically, such an amalgam would seem to have the defects that a compromise always has in war. If old-style cavalry still have a role, they should remain horsed; otherwise they should be mechanically converted to new style cavalry. I imagine that those who are really convinced of the horsemen's value would prefer to stand on their own hoofs. Then at least they would be able to prove whether they could move and fight where mechanized troops could not. But one finds more and more that cavalrymen recognize that their fighting days are over—ended by their own excessive vulnerability to modern fire weapons. The argument for their retention seems to focus purely on their value in reconnaissance and on their short-range power to move over certain tracts of ground where vehicles are " stymied." In this case it seems that the most reasonable way of assessing the issue would be mathematically. The value of information depends, first, on its exactness and, secondly, on the quickness with which it is gained and

got back. Which is quicker—to travel nine and three-quarter miles on a horse and a quarter of a mile on foot, or to travel nine and a half miles in a swift machine and half a mile on foot? The answer is unmistakable, and the conclusion surely unanswerable. And it is well to remember that as the range of a reconnaissance increases, so does the advantage of the more swiftly moving means of transport, to the point where the final stage must be made on foot.

It is characteristic of human nature to shrink from pitiless logic, and characteristic also to cling to an old friend which may have an occasional value for an exceptional purpose. But even if we concede the fullest claim now made by enthusiasts for the horse, it is clear, indeed all the clearer, that we do not need large units of horsed cavalry, but merely a few score picked men in each division to furnish patrols.

The best excuse, though not a reasonable justification, for maintaining cavalry brigades is that they provide practice for leaders in applying mobility. A younger generation is likely to arise, bred up with mechanized vehicles, who will be imbued with mobility of thought and action. But at present it is unhappily obvious that few commanders have been able to shake off trench-warfare deliberation. Some commanders have a natural gift for mobility, or in their war service missed the danger of developing immobility. But, otherwise, cavalry-bred commanders seem the most free.

In this year's exercises realism was obscured, and the broader issues confused, by misdirection of the "armoured" strokes. One is not referring merely to the neglect of strategic objectives, such as communications and depots. This potential aim is certainly underrated, because British soldiers know too much about that very overrated cavalry leader, "Jeb" Stuart, and far too little about the effect achieved by Forrest and Morgan. The "romance" of Stonewall Jackson has blinded them to the deeper lessons of the campaign in the West, where Grant turned, and Sherman decided, the issue of the Civil War, and where the exiguous mobile forces of Forrest and Morgan went far closer than the main Confederate armies to frustrating their purpose.

Even so, mobile forces must often aid the general plan by closer action against tactical objectives. But these should be apt targets. Unfortunately, in peace exercises much unreality exists and false lessons are drawn because the administrative services, the second-line transport, and the various headquarters assume such puny proportions compared with their war scale. They are peculiarly difficult to cover against the thrusts of armoured mobility, but because they are small in peace exercises they are difficult to strike, and their assailants are rarely accorded full and real value for striking at them. Perhaps this is the

reason why instead of striking at the enemy's immediate rear, the armoured units are still habitually aimed at a front which he has had time to prepare for anti-tank defence. An armoured brigade should be given full latitude to avoid the enemy's anti-tank defences. Its line of approach should be as indirect as possible, and mobility gives it a wide range of possibility. A blow at the enemy's headquarters, signal centres, transport lines, and supply columns, would be likely to paralyze all the combatant troops that are dependent on those vital organs. In contrast, infantry disposed and dispersed for defence are a difficult target to hit, although in actual war they might not stand the sight of an oncoming swarm of modern high-speed tanks.

Again, the habit of launching tanks, or keeping them to launch, at the enemy's tanks is an unconscious tribute to the power of armoured fighting vehicles, a proof of the instinctive fear they increasingly develop in the minds of commanders. But it is not generalship. A general should employ his tools in the way that produces the maximum profit, not merely to cancel his opponent's assets. Moreover, this direct use and misuse of tanks not only confuses the essential issues of to-day, but confuses the battle picture. Thus it confounds umpiring and makes peace exercises more than ever unrealistic.

Mr. Rudyard Kipling was present at one of the exercises on Salisbury Plain, and the story is going round that he was asked his impression of modern war as there presented. He is said to have replied : " It smells like a garage and looks like a circus." An apt and witty mot, and the circus element was certainly prominent on the " battlefield " as well as on the road. But it was due mainly to misguided choice of objectives, and the tendency to seek in unreal battle what could have been better attained by indirect paralysis.

Of course, the misuse of tanks may be read as a tacit admission of their potency, a recognition that a battle without them is unthinkable, and that the other arms without them are powerless. It is a back-handed compliment. Because they are so few in proportion to the infantry, and yet so essential, they are called upon disproportionately. The infantry are often saved loss and exertion by their very immobility ; the cavalry by their vulnerability, also because all soldiers are horse-lovers, and so, when in command, gauge generously the needs of the horse for rest and water. In contrast, and in paradox, the less they value machines the more do they commonly expect of them. This tendency entails not only undue wear and tear, but tactical waste. We have come to count on tanks out of all proportion to the number that we can count in our present organization.

Gropingly yet definitely, our Army has taken a lead in mechanization. By comparison with other armies its situation is favourable. By comparison with the need, however, its state is not merely unsatisfying but unready. All armies, our own more than any, have made more progress in the past decade than in any previous decade of peace. Yet relatively to the changed conditions the change is less than it has ever been. And so it is utterly inadequate. Armies as at present are not an insurance; they are a petition in bankruptcy.

Expressed mathematically, change in armies has usually moved at the same pace as change in the conditions of war, but several marches in rear. In the last decade the pace of armies has quickened to a run. But the pace of scientific and mechanical progress has been revolutionized, not merely accelerated. Thereby the armies of to-day are as helpless, and their prospects as hopeless, as a portly policeman trying to catch a motor thief—the thief of time. The consequences may be even more simply expressed. The armies of 1914 had over two months of grace before they lapsed into the stagnation of trench warfare. Nowadays the proportion of machine-guns and other automatic firearms has increased enormously. No army has any scale of artillery approaching the proportion which in the later stages of the war could make a graduai advance possible by plastering whole areas with shells. The number of serviceable tanks is but a trifle of the infantry strength of any army. As the habit is still to use them for bolstering up the infantry, and so to throw them against the positions best furnished with counter-means, the existing few would soon be used up.

It is thus a safe deduction and prediction that the armies of to-day would sink into trenches within a week if they ever got to grips. For there is more than a possibility that these infantry bodies would be dispersed by air attack or hamstrung by the bombing of their transport while they were still groping forward.

Every effort has been made to prop up the infantry, and to ensure them a role befitting their nominal dignity as the principal arm. Yet their attempt to simulate virility has been no more convincing than that of the "principal boy" in a pantomime. They have been endowed with green and white flags to represent anti-tank guns, and these most versatile weapons have been allowed to score a percentage of hits such as no weapon has ever approached under war conditions.

On the other hand, the tanks have been heavily handicapped by the narrowness and artificiality of manœuvre areas, by their own fewness and obsolescence and not least by the way commanders have employed them: too often to the negation of their mobility. Yet infantry padding and tank slimming have alike failed to disguise the natural outlines

of these trials. In each of the Aldershot and Salisbury Plain exercises the tank forces, so slender compared with the infantry bulk, dominated the situation. They have dominated it more each year, but most of all this year.

It is not merely by their mobility, for this has been restricted, that their influence has been exerted, but by their subtle moral effect. Any commander of a large infantry force who knows that the other side has a small armoured force is subject to this. All his ideas and movements are governed by his concern as to its whereabouts and its latent menace. It cramps him at every turn, and he is compelled to take such care for his own security that his offensive purpose becomes a secondary and flickering impulse. It is often amusing to see those who have been most disparaging of mechanization become most concerned when they have to command.

If the self-protective instinct becomes so predominant in peace it is likely to spell paralysis in war. No commander will ever feel safe in executing a plan. If he is about to take the offensive, and hears of a hostile armoured force in the offing, what will be the effect on his purpose? If he has actually begun an attack, will he continue it? Perhaps it would be not all loss if his resolution falters, for, as we have already pointed out, there is not the least ground for expecting that an infantry attack could succeed against a modern enemy in a position that he has had a few hours to prepare.

Thus the problem of to-day is not merely what tanks can do, but what mental and moral effect they can have. And here lies the ground for declaring that talk about "gradual mechanization" is merely a soothing draught, which though innocuous in itself, is indirectly perilous to administer to a grave case. The need for thorough conversion is urgent. If anything could accentuate its urgency it is the knowledge of the vulnerability of all unarmoured columns to air attack.

The significance and effect of the bombing attacks on bus columns in the first two Salisbury Plain exercises was clear to any reflective mind. In many cases, such a mobile column would probably have remained as an immobile heap of wreckage, far behind the place—and the time it was wanted. Marching columns may be less easily blocked than bus columns, but are more easily dispersed: an equally powerful brake on effective advance. Only when using pure armoured formations is this danger lessened. Otherwise the commander's strategic plan may suffer a paralytic stroke.

Let us, however, for the sake of argument take up the most moderate ground, and concede the claims, whether logical or not, made for the preservation of the other arms. On this basis, and in the light of this

year's exercises, let us put a simple question. If any commander who took part was offered a division, either comprising the usual three infantry brigades or comprising one infantry brigade and one armoured brigade, which would he choose? One cannot believe that even the most conservative general would still prefer the former if he had to bear the responsibility of command. And if this be the conclusion from Salisbury Plain and Aldershot, how much stronger would it be in a theatre of war where there was no forbidden territory nor inviolate fences to cover his flanks, and where he could not so easily gauge the whereabouts and approach of an enemy armoured brigade?

Hence what justification is there for preserving, even for the present, the infantry pattern of our five divisions? Once we have read the writing on the wall it does not diminish the danger to remain gazing at the wall.

Only perhaps at one point can one detect a silver lining to the cloud that hangs overhead. It is in the cultivation of generalship. For the first time since the era of Waterloo, foreign armies have their eyes on ours, and are being influenced by our experimental lead. The pre-war Army, splendidly efficient as it was in many ways, did not draw such a tribute. Looking back one can see how we have progressed. A few years ago most of our schemes—as those of other armies still do—dealt with forces which were acting *encadrées*, fighting side by side in a series of narrow compartments. These reduced the commander to the level of a machine-tender instead of an artist.

This year nearly all schemes, whether they dealt with battalions or divisions, were devised to encourage free manœuvre and strategic judgment. Superficially it may seem a paradox that mechanization should be making war less mechanical. But its effect is perfectly natural. For by restoring mobility and fluidity it is breaking the shackles of trench warfare, the most mind-deadening form of war. This free play of thought and manœuvre may not be an instant development. This year again one has seen commanders who rigidly followed a pre-conceived idea, with no attempt to give their plan and dispositions the elasticity which would allow them to be varied, so as to meet the enemy's action. One has seen, too, neglect to take alternative objectives, even when the scheme provided this essential chance to mystify the opponent. And when will commanders in their appreciations instinctively consider not merely the sound course, but the course of least probable expectation? Now, however, that scope for the art of war is given, there is hope that this art will revive.

THE CHEMISTRY OF WAR

By MAJOR F. A. FREETH, O.B.E., F.R.S., D.Sc., Ph.D., F.I.C., F.I.P.

On Wednesday, 19th March, 1930.

ADMIRAL OF THE FLEET SIR HENRY F. OLIVER, G.C.B., K.C.M.G., M.V.O., LL.D., in the Chair.

THE CHAIRMAN, in introducing the Lecturer, remarked that he was well known in the scientific world.

LECTURE.

THE scope of my subject, the Chemistry of War, is so wide that, except for a few generalizations by way of introduction, I must necessarily limit my remarks to some of its salient features.

Modern warfare amounts practically to an industrial mobilization. Consequently the chemical industry, which plays an intimate part in almost every national industrial activity in peace, is thereby concerned with the production of nearly every material used in war. For example, the great alkali trade, which has an enormous output, and whose main products are known in commerce as soda ash and sodium hydrate—commonly called caustic soda—is much involved in all cotton, wool, glass and paper-making industries. In studying the chemistry of war, therefore, one of the first considerations is to appreciate the general chemical resources of a country.

As regards Great Britain, it may be said without hesitation that what may be called her chemical potential is to-day immeasurably stronger than it was before the war. Let me take a few points: the number of workers employed is vastly greater, and the number of experts available has been at least quadrupled, while chemical manufactures which before the war were unknown in this country are now in active operation. For example, the industry of fixing the nitrogen of the atmosphere—fixed nitrogen being an essential of warfare—did not exist at all in this country before 1914, so we were compelled to draw our supplies from overseas and from what you might call secondary sources. Again, the dyestuffs industry is in a similar position. Great Britain now possesses a strong dyestuffs manufacture whereas that industry before the war was very limited in extent and scope.

Now to turn to the main outline of my subject, namely the chemistry, production and sources of supply of materials actively used in warfare; the largest class of all is naturally explosives. In parenthesis it might be remarked that the public at large do not seem to be aware of the very great extent of the explosives trade in time of peace and the immense amount of these materials which are used in quarrying, coal mining and so forth. It is not far short of the truth to say that the amount of blasting explosives used in this country during the war was of the same order of magnitude as that of cordite used overseas.

An explosive is either a chemical substance, or a mixture of chemical substances, which under a stimulus is capable of re-arranging the elements of which it is composed in such a way that it is nearly all turned into gas at a very high temperature. In fact, it might almost be said that an explosive is a substance which is capable of setting fire to itself. Consider for a moment that historic explosive, gunpowder. Gunpowder is composed of charcoal, which we can call carbon, potassium nitrate, or saltpetre, and sulphur. If sufficient heat is applied to gunpowder it burns with intense rapidity, the oxygen of the potassium nitrate being released to burn the carbon and the sulphur. The result is the production of a large quantity of nitrogen, oxides of carbon and oxides of sulphur at an extremely high temperature.

The usual classification of explosives depends upon the rate at which they work and upon their stability. Explosives of the propellant class work comparatively slowly, the explosive class proper much quicker, and the detonator class quicker and more easily still. Some explosives are so sensitive that they cannot be used under any circumstances whatever, for example the iodide of nitrogen will sometimes go off if turned over with a feather, and sometimes without as much encouragement as that.

The invention of the nitration of cellulose and glycerine marked a a revolution in explosives. Cellulose is essentially a vegetable material, occurring as it does in every form of plant fibre: in the case of cotton it is nearly pure. It is possible, as I shall show later, to nitrate cotton in such a way that it becomes extremely inflammable and under properly controlled circumstances will explode. Glycerine is an essential constituent of fats and is automatically produced when soap is made. Pure nitro-glycerine is seldom used, since it is not sufficiently stable; on the other hand, when mixed with other materials it may be rendered perfectly stable. Nearly all explosives, and certainly all those which are used in quantity, contain what is known as fixed nitrogen. That is to say nitrogen which is combined with oxygen in such a manner that it will readily part with it, the oxygen going to burn the carbonaceous

matter of the explosive with intense violence and the nitrogen being liberated. Fixed nitrogen under these circumstances is employed as a raw material in the explosive trade in the form of nitric acid : HNO_3

Up to the Great War practically all nitrogen so combined had been obtained in the form of nitrate of soda which had to be imported from Chile, and during the war Great Britain continued to rely exclusively for her supplies of nitric acid and nitrates on this material, even though this constituted a heavy additional strain on our sea transport and the naval forces required for the defence of shipping. But the case of the Central Powers was very different. Even before the war Germany had realized that her navy, ever increasing though it was, could not be relied on to ensure supplies by such a long sea route as that from Chile. Another source of supply had to be sought. Now nitrogen constitutes four-fifths of the air we breathe, and by the time war broke out two processes for extracting it had been devised in that country. These were the Haber ammonia process and the Ostwald nitric acid process.

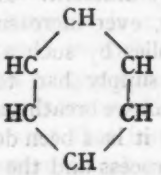
The Haber ammonia process consists in taking coke, that is to say carbon, and burning it in a mixture of air and steam in such a manner that nitrogen, hydrogen and a mixture of the oxides of carbon are produced. The oxides of carbon are removed and the residual mixture of nitrogen and hydrogen is compressed to a high pressure of the order of 3,000 lbs. per square inch and passed over a hot material called a catalyst which causes their combination to form ammonia. Once the Germans were in possession of ammonia the rest was not difficult. It is possible by mixing ammonia carefully with air and passing it over yet another catalyst to burn it partially and produce nitric acid. This is the Ostwald process. Thus you will see that a country in possession of coal, air, water and sufficient technical ability, is able to fix any amount of nitrogen. I have already mentioned several times that fixed nitrogen is a key material for the production of explosives. It is also an essential for agriculture, especially for the cultivation of cereals. This means to say that the production of fixed nitrogen can be a large peace-time industry. In this country, as is now known, we are fixing an enormous amount of nitrogen every year in the form of ammonium sulphate. Accordingly we can confidently assume that in the event of future war we should be practically independent of oversea supplies of sodium nitrate.

There is another material which does not appear in the final explosive but is essential to its manufacture : that is sulphuric acid. Most of these nitrogen-containing bodies are produced by the addition of nitric acid, but the addition of nitric acid alone would, in most cases, cause the reaction to become uncontrollable, so that the nitric acid must be

mixed with a large quantity of sulphuric acid, a good deal of which is subsequently recovered.

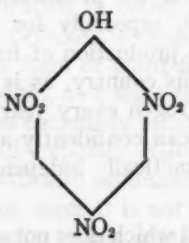
Now let us consider the principal modern explosives, namely, picric acid, trinitrotoluene, ammonium nitrate and cordite. The first three are explosives proper, that is to say they are used in shells, mines, etc.; the last is a propellant.

Picric acid and trinitrotoluene resemble each other very closely in chemical formulæ. Benzene has the formula C_6H_6 and is so built up that the six carbon atoms form a hexagonal ring and have each a hydrogen atom attached to them. Thus :—



Benzene has the property that all or any of these hydrogen atoms can be replaced by various other atoms or chemical molecules; for example, if one of the hydrogen atoms is replaced by an hydroxyl group, the resultant compound is called phenol, the trade name of which is carbolic acid. If in another case one of the hydrogen groups is replaced by methyl (CH_3), the resultant compound is called toluene. The proper manipulation of such substitutions and the knowledge of the constitution of the bodies so formed has been built up by the organic chemist with immense labour, skill and ingenuity during the last eighty years.

Let us return to picric acid. As already stated phenol is a substituted benzene. If we take phenol and nitrate it in such a way that it has three symmetrical NO_2 groups in it the resultant compound is trinitrophenol or picric acid :—



This substance was used as a dye for many years without anyone having any idea that it can be a violent explosive. It was not until a terrific explosion took place in Manchester about fifty years ago that its dangerous properties were recognized. During the war enormous strides

were made in the nitrating of phenol, which used to be a very slow, small scale and offensive process. The method of manufacture is roughly as follows. The phenol is first treated with sulphuric acid and turned into phenol sulphonic acid. It is then carefully treated with nitric acid. During this process a very large quantity of the fumes of nitrogen oxides are given off. These are collected, turned to nitric acid, and used over again. I cannot enter into further detail, but will refer those interested to a paper by Mr. William MacNab, published in the Journal of the Society of Chemical Industry in December, 1922, Vol. 51, on some achievements of Chemical Industry during the war in this country and in France.

Phenol is derived as a bye-product from the distillation of coal and can also be synthesized from benzene through a rather complicated series of processes. I have already shown the similarity in formulæ between phenol and toluene. When we come to consider toluene, however, we have to note a sharp distinction for, whereas phenol can be fairly readily synthesized from benzene, it is very difficult to make toluene by an analogous process.

Toluene is a bye-product in gas manufacture. The quantity available from this source is not very great. Toluene occurs in nature in the petroleum of the Dutch East Indies, and during the war we imported enormous quantities of this material. It was first of all fractionated by distillation into a mixture of toluene and petrol. This mixture on nitrating gave mono-nitrotoluol in the first stage of nitration, which could be readily separated from the petrol and then worked up into trinitrotoluol. This is done as before by treating it with a mixture of nitric and sulphuric acids. Trinitrotoluene has some extremely valuable properties. It is very stable, and before the war was not even considered as explosive, within the meaning of the act, but, as we learnt to our cost, most formidable explosions can occur owing to the presence of other materials which may be associated with it.

In parenthesis I should like you to note that there is an essential difference between naval and military explosives. Explosives for naval purposes have to be particularly pure and stable. The reason for this is obvious. In the case of an accident it would mean the loss of a ship and the ship's company, a very serious matter. This need for excessive stringency in naval supplies has of course a disadvantage when one comes to mass production. In the middle of the war, however, it was possible to take a chance with explosives for military purposes because the explosion of a dump is nothing like so serious a matter as the loss of a ship, moreover in war explosives are very quickly used, which also facilitates lessened restrictions. In peace time just as much trouble is taken in the manufacture of a military as of a naval explosive.

I mentioned a moment ago that trinitrotoluene possessed some very valuable properties. Its most useful quality is the fact that it can be used to dilute, as it were, ammonium nitrate—for example, 20 parts T.N.T. to 80 ammonium nitrate, the amatol of the war—without in any way impairing the explosive qualities of the original T.N.T. This discovery, which possibly was forced upon us during the last war, may prove of immense importance in the future.

Now let us consider sources of supply. A moment ago I mentioned that a very large amount of toluene was obtained from overseas sources. If for any reason this were impracticable, it is probable that other explosives of a similar nature, using benzene as their base, could be substituted for toluene. In any case I think it may be assumed that ammonium nitrate containing a small proportion of a substance such as trinitrotoluene will play an immense part in future wars. The reason for this statement is as follows. During the last war in spite of our difficulties we managed to produce an enormous quantity of ammonium nitrate. How much more easily shall we be able to do it now that we are in the possession of ample supplies of fixed nitrogen of our own ?

We now come to ammonium nitrate. Here the situation is entirely different. The difficult and unwieldy methods used in the war can never be used again. Ammonium nitrate as its name implies can simply be made by the neutralization of ammonia with nitric acid. As already stated, we now make in this country immense quantities of ammonia which can readily be burned to form nitric acid. Consequently the production of ammonium nitrate on a vast scale, if and when required, in this country is a certainty.

At the risk of recapitulation I want to comment briefly on the relative merits of these three explosives. There is probably little to choose between picric acid and T.N.T. But the strong point of T.N.T. is the fact that it can suffer a three-fold dilution with ammonium nitrate and therefore, from the point of view of production in quantity, is extremely valuable.

Our next explosive is cordite, which in its varied forms constitutes our chief propellant. The propellant of war from Agincourt to the Crimea was gunpowder. The discovery that glycerine and cotton could be nitrated has changed the whole aspect of modern warfare Let us start with glycerine. Glycerine has the formula :—

$$\begin{array}{l} CH_2OH \\ | \\ CH—OH \\ | \\ CH_2OH \end{array}$$

When nitrated with a mixture of nitric and sulphuric acids it forms a liquid. It was the labours of Alfred Nobel which rendered the employment of this dangerous liquid a commercial and military possibility.

It is hardly possible to give a strict formula for nitrocellulose, but it is not difficult to show its type:—

$$\begin{array}{l} CH_2—O—NO_2 \\ | \\ CH—O—NO_2 \\ | \\ CH_2—O—NO_2 \end{array}$$

Both compounds, nitroglycerine and gun-cotton, are somewhat similar from what might be called a chemical aspect. Cordite is a mixture of two of them. Gun-cotton is treated with nitroglycerine mixed with mineral jelly which acts as a kind of stabilizer in the presence of a solvent. The resultant pasty mass is pressed through a die and carefully stoved to remove the solvent, usually alcohol acetone or ether acetone. There are also processes which will dispense with all volatile solvents. Cordite is an amazingly flexible material. By making it of various diameters it is possible to induce such a rate of burning as will suffice both for the service rifle and for the 18-inch gun. Its raw materials are cotton and glycerine. As regards substitutes for cotton there are various possible sources of home-grown vegetable supply, but I think it may be taken for granted that a nation should possess at least a season's supply of cotton before embarking on a war, and preferably should be assured of supplies throughout its probable duration.

As regards glycerine. Glycerine is mainly produced from animal fats in the process of soap-making. It is, however, possible to produce it by the fermentation of molasses, and in this respect it is worth while making a generalization upon necessities in time of war. The ingenuity and resources of chemical industry are remarkable when those who have to employ them are driven into a corner. For example, it is possible to make sugar from sawdust or other cellulosic material, and then to ferment it into glycerine. I always think that those, who say that it is only necessary to deprive an industrial country of this or that substance so that it may not be able to prosecute a war, are not relying sufficiently on the proverb that necessity is the mother of invention, for it is perfectly astonishing what human ingenuity will do when it is forced to it. Once again we find that as regards cordite the fixed nitrogen is an essential, but as we have already seen, this country is now independent of overseas supplies of fixed nitrogen.

We now come to gas, the most difficult part of my subject. The views I am here expressing are my own, but I am convinced that they

are not far distant from reality. It is impossible to keep what might be called the psychological aspect out of any side of human affairs. In no department is this less the case than in war. Take for example the searching moral training to which every branch of the Services puts its recruits. We have pride of Service, pride of regiment, tradition, discipline: all matters which have engaged the attention of every commander from prehistoric times down to the present day, and which in spite of the apparent logic of some of their detractors still constitute a vital force. But when we come to gas the psychological position is most confused. There are any number of men prepared to face the greatest dangers of war, but who are far more afraid of gas than the occasion warrants. Gas is undoubtedly a potent weapon within a restricted range. But I would like here and now to protest against the idea which many people have that science is possessed of gases of an amazing killing power. In practice it will be found that a body of well-informed opinion exists which contends that the only really useful gas is mustard gas, about which I would like to say a few words.

Mustard gas is made from sulphur monochloride ($S_2 Cl_2$) and ethylene $C_2 H_4$. Its formula being :—

$$S\begin{matrix}\diagup CH_2—CH_2Cl \\ \diagdown CH_2—CH_2Cl\end{matrix}$$

its scientific name being BB di-chloro di-ethyl sulphide.

Some time ago I saw a picture in an illustrated paper depicting the effect of a bomb dropped in a big London circus, which had laid out everybody with gas for about a quarter of a mile all round. I venture to say to you that on an average day this is absolute nonsense. Of course, gas applied to the right unfortunate person at the right time is a lethal weapon just as, if I were hit on the ear with a six-inch shell I should become a casualty. But to say that death and destruction can be dealt out over a wide area when the people concerned still possess any powers of running, as I am sure we all agree they would have, is an absurdity. The really serious result of all the imaginative journalistic work upon gas is its effect on the nerves of the civilian population. You will find a reasoned account of the use of gas in warfare by Dr. Herbert Levenstein in the Proceedings of the Society of Chemical Industry for February, 1930. There he makes the striking remark that the fewer the number of guns opposing a belligerent using gas, the greater is the importance of this weapon. But this does not imply that the side which employs gas will not secure a great advantage.

You will notice that I have emphasized the great change that has come about in this country with regard to our potentialities for supplying

our own explosives. Let me show you what this might mean from the point of view of saving tonnage in a future war. For purposes of comparison let me suppose that we shall consume a similar amount of explosives to that which we used in 1914–1918. These quantities were :—

Picric acid	68,500 tons
T.N.T.	23,800 tons
Ammonium nitrate	378,000 tons
Cordite	139,000 tons

It is safe to say that if we made full use of our home resources we could, under present day conditions, save 2,000,000 tons of freight.

Next I want to say a word now about oil from coal. This is really an economic problem. If anybody desires to produce oil from coal, and is prepared to find the money, he can do it. Immense sums are now being spent on various processes, but as yet the solution, from a commercial point of view, is still dependent on lowering the cost of production ; in other words, it is an economic question, and it must remain so, especially in view of the immense world production of oil.

Chemistry is also intimately bound up with metallurgy and with lubricants. To take metallurgy. A high authority recently announced that if any Power could reserve to itself all the nickel in the world, war would become impossible. Other people, too, have stated that reserves of various materials would make war impossible. But I would ask you to remember that the more science advances, the more substances we shall be able to produce. Personally I believe that metallurgy is still an infant science, and I think he would be a bold man who would venture to assert that in the next thirty or forty years we shall not see an immense improvement in every shape and kind of metals.

In effect, therefore, it seems to me that to assert that it is possible to stop war simply by tying up, or "cornering," any commodity, is merely a display of ignorance of the subject, because it ignores human nature. So long as men remain what they are, the possibility of war recurring will always exist. Remembering, too, the advance of science and the extraordinary resiliency of the human mind, it is my opinion that if the Fijian Islanders wished to go to war in ten years' time they would find a method of doing so.

DISCUSSION.

CAPTAIN E. ALTHAM, R.N. : Can the Lecturer throw any light on the question of substitutes for oil and petrol for internal combustion engines. We know, for instance, that the distillation of wood is being applied on a large scale by the French for mechanization purposes. This is a factor which might prove of great importance in future wars in the event of supplies of oil being cut off. Are there

other raw materials which show promise of being used as substitutes for motor fuel?

THE LECTURER: There are roughly between 200 and 300 processes which have as their object the low temperature distillation of coal. But once again we are faced by the economic factor. There is no doubt that if we were forced to it we could produce in this country a large quantity of motor spirit from coal by processes of distillation. As a matter of fact, the production of petrol from coal is more likely to prove an economic proposition than the extraction of oil from coal. To make heavy ship oil from coal is, I think, a doubtful proposition. Still, there is a sporting chance that it will be done.

It is also possible to make methyl alcohol which can be used in internal combustion engines. It is not quite an economic matter at present, but the substitution could be effected. There are no raw materials except coal in this country which show a promise of becoming a source of fuel.

VICE-ADMIRAL W. H. D. BOYLE: I do not quite understand the position as regards oil. Can we take it that it is only a question of putting sufficient money into it to enable us to produce all the oil we want from coal in time of emergency?

MAJOR FREETH: I think you could, if you are prepared to lay down a big plant. If the worst came to the worst, we could do it,.

THE CHAIRMAN: It depends on the quantity required; it would need a considerable time to get it working?

MAJOR FREETH: Yes, it would take a good deal of time—eighteen months to two years.

THE CHAIRMAN:

I think we are very much indebted to the Lecturer for having given this very interesting address on what is, to me, a very obscure subject.

It is reassuring to hear that the chemical industry of the country is able to save us two million tons of freight in the event of a war. That is a very valuable consideration because, to my mind, we have cut things so very fine already that we shall need a genius to protect our oversea trade in the next war. I can only say I could not do it, and I have had some little experience in trying to.

The customary votes of thanks to the Lecturer and Chairman were carried by acclamation.

THE VALUE OF TIME
A PRINCIPLE OF WAR?

By " PHORMIO."

TO make the best use of the time available is so evidently a factor of success in any enterprise, that its standing as a Principle of War is a question more of point of view than of fact. Let it be admitted from the start, therefore, that it may be possible to include this idea in what is known as the Principle of Mobility. But it is the aim of this article to show that such a classification is particularly unsuitable for naval warfare, and further, that the idea of never losing time has an importance which far exceeds any normal interpretation of the term " mobility." It is both simpler and of greater value.

Should this aim be achieved it follows that the Principle of Never Losing Time is entitled to a foremost place in any list of principles which is of real value to the Navy. By such a list is meant, not an academic summary of the whole art of war, but a collection of basic ideas, simple yet important, seemingly obvious yet constantly of value, which should ever be kept in mind in the planning and conduct of the operations of war.

MOBILITY.

Let us examine the claim of the Principle of Mobility to cover the idea of never losing time. It is true that it carries with it the idea of covering space in the minimum time possible. But there is more in the value of time than that. To give only one example: the decision to postpone action so as to give men time for a meal (e.g. the Battle of the Falkland Islands) is contrary to the Principle of Never Losing Time. But it is only by a considerable stretching of words that it can be put down as contrary to the Principle of Mobility.

Again, if the Principle of Mobility really covers the idea of never losing time, one would expect to find some mention of this in Sir Frederic Maurice's recent explanation of the official Principles of War.[1] But one can search his chapter on the Principle of Mobility without finding any direct reference to this idea.

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[1] " British Strategy." (Constable, 1929).

From a naval point of view there is a further objection to including the value of time under the heading of mobility. The whole training and outlook of a naval officer lead him to look on mobility as a quality which must be balanced against armament and protection in the design of ships. Once the ships are built, mobility is primarily a physical attribute of ships and fleets, dependent on their speed and endurance and the arrangements for refuelling. One may go further and make this term cover the idea of sea-room, both actual and with regard to the enemy. To go further still, however, and make the Principle of Mobility cover the idea of never losing time is to call for a species of mental gymnastics which is too unsure a basis for an idea of outstanding importance.

Special Importance of Time in Naval Warfare.

There is one simple characteristic of sea warfare—and possibly also of war in the air—in which it differs fundamentally from war on land. It is that the forces of either side can, so to speak, completely remove themselves from the board, although remaining intact. By retiring into a defended harbour a fleet is no longer liable to be defeated by an opposing fleet. It may be possible to " dig it out " and destroy it by a combined operation—possibly by a combination of the Navy and the Air Force, without the help of the Army. But it cannot be destroyed by purely naval means. Despite all advances in material we have still to face the fact that an enemy fleet may frustrate all our endeavours to defeat it, simply by retiring to its base.

This fact is so evident that its significance is sometimes overlooked. In actual warfare allowance is made for it almost instinctively. But when dealing with theoretical principles of war: principles which have been built up chiefly on a study of land warfare, it is of great importance that this matter should be given due weight.

It is this characteristic which gives the Principle of Never Losing Time its outstanding importance in naval warfare. Chances of engaging and defeating the enemy, once lost, may never recur. It is only by making the utmost use of the time available that we can turn to the best advantage such chances as come our way.

The Value of Time in Strategy.

The importance of never losing time in matters of strategy is usually so evident that one need not labour the point. In many cases it is more a matter of temperament than of principle. Everyone knows that time should not be wasted, but the dilatory or deliberate will always spend more time on an operation than the prompt and dashing. Occasions will sometimes arise, however, when there are good and just reasons,

possibly with firm foundations in other Principles of War, which weight the scales in favour of delay. It is then that the Principle of Never Losing Time assumes its real importance.

An interesting example of the working of this principle is to be found in the capture of St. Lucia in 1778, one of the most brilliant combined operations in our history. In the XVIIIth century a West Indian island possessed an importance which in these days it is hard to realize. But such was the case, and on the capture of St. Lucia, both for its intrinsic value and as a strategic point, Rear-Admiral Samuel Barrington had set his mind. It was not, however, until winter in the northern theatre of war set troops free for the purpose that his object could be achieved.

At that time Barrington was at Barbadoes with two ships of the line. The French, based on Martinique, had no heavy ships, but news was daily expected of the arrival of a battle squadron from North America. Barrington could count on a further five of the line under Hotham arriving with the troops, but even so would probably be in a position of inferiority after the arrival of the French reinforcements.

On the 10th December, 57 transports from New York, carrying 5,000 men and convoyed by Hotham, arrived at Barbadoes. Without allowing a man to land, the whole force, fleet and transports, sailed for St. Lucia. On the 13th the troops were landed, and within twenty-four hours all important positions round the principal harbour were in our hands.

What of the French reinforcements? A squadron of no less than twelve of the line under d'Estaign had actually arrived at Martinique three days before Barrington left Barbadoes. At Martinique there were 9,000 troops. On 14th December this combined force appeared off St. Lucia—just too late to prevent its capture. Not only had the British arrived in time to capture the island, but no time had been lost in organizing its defence. The troops held strong positions on Morne Fortuné and on the Vigie peninsula. The heavy ships, with transports inshore of them, were warped well into Cul de Sac Bay, where they were practically out of reach of an attacking squadron. The French, unable to destroy our squadron, landed troops to the northward and attacked the Vigie position. In spite of great superiority of numbers they were repulsed with heavy loss. All our positions were held and further strengthened.

A fortnight later the whole French force retired to Martinique.

A simple enough story of the reward of promptness in action. But there is more in it than that. It is when we come to consider the

inducements to delay which were present in this episode that we realize its true value.

In the first place, let us imagine the arrival of the troops at Barbadoes. Five weeks at sea, cooped up in small ships with no drill and no exercise, and with no recent practice in landing in face of opposition. Whether it occurred is not recorded, but one can well imagine the General putting forward a plea for a few days ashore to refresh and drill his troops—a matter of great importance in any combined operation. It would seem the most reasonable proposal in the world, and a less spirited officer than Major-General James Grant might well have held out for it. But Barrington was so convinced of the value of time that, with the support of Grant, he decided not to delay a moment—and the object of the expedition was achieved by the narrow margin of a few hours.

Let us consider also the purely naval aspect of this expedition. To undertake it in face of superior force would have been an extremely hazardous proceeding. The French forces had previously been negligible, but it was known that heavy reinforcements were expected ; they might in fact have already arrived. What courses of action were open to Barrington ? Perhaps the most obvious was a thorough reconnaissance of Martinique before attempting to sail the whole expedition. Sounder still might have been an attempt to defeat or neutralize the enemy, provided they were not in too great force. But to Barrington all these weighty considerations gave place to the supreme importance of time. He knew that his only chance of success lay in acting while the arrival of the French reinforcements was still in doubt. To risk giving them additional time to establish themselves on the station would be to ruin his hopes. He therefore sailed at once with the whole of his force. By throwing out a screen of cruisers he did his utmost to provide security ; but he permitted no operations which might cause delay.

How fully his decision was justified in the event we have already seen.

The Time Factor in Tactics

If the Principle of Never Losing Time has an important position in strategy, as illustrated by the foregoing example, its effect on tactics is equally vital. In fact it is probably in the domain of tactics that we should be most careful of the application of this principle ; not because of its greater importance, but because its effect is usually less obvious and, therefore, the more liable to neglect.

The importance of the time factor cannot be more clearly shown than by referring to that Memorandum of 9th October, 1805, which embodies the tactical ideas of Nelson when at the height of his powers.

It opens with the sentence :—

> " Thinking it almost impossible to bring a fleet of forty sail-of-the-line into line of battle in variable winds, thick weather, and other circumstances which may occur, without such loss of time that the opportunity would probably be lost of bringing the enemy to battle in such a way as to make the business decisive, . . . "

It is this idea of avoiding " such a loss of time," which underlies the whole plan of battle then unfolded. It is this which is responsible for the most revolutionary feature of that plan : " the order of sailing to be the order of battle "—an organization never attempted with so large a fleet since the primitive semi-organized group tactics of the XVIth and early XVIIth century had been succeeded by the close-hauled line of battle.

If prominence was given to the Principle of Never Losing Time in that famous memorandum, the importance assumed by this principle in the battle of Trafalgar itself was even greater. Every other consideration was thrown aside in order that not a moment should be lost in getting into action. For a long period at the beginning of the battle the Principle of Concentration went by the board. Squadrons came into action piecemeal. Ships came into action in a manner which imposed on them the greatest gunnery disadvantage. But the battle was won.

It is no doubt true that the known inefficiency of the Franco-Spanish fleet entered into Nelson's calculations. But even then the risks of his method of attack must have been very great. They were taken for the simple and all important reason of not losing a moment, of ensuring that our fleet should have time " to make the business decisive " by nightfall.

It is difficult not to contrast the tactics of Trafalgar with the principal tactical idea which was current in 1914, and which may still be held in some quarters. By this is meant the idea that we can best achieve success by relying on superior gunnery at long range. It is here that we see most plainly the difference between " never losing time " and " mobility." For it was in effect the Principle of Mobility which was invoked by those who believed in long range gunnery. Not only were we to have bigger guns than the enemy so as to sink him at extreme ranges, but we were to have higher speed and use our superior mobility to dictate the long range we desired.

This theory had, on the surface, much to recommend it, and it was strongly supported by our very real fear of the torpedo menace at shorter ranges. But it entirely disregarded the Principle of Never Losing

Time. It took no account of how easily a change of weather or the coming of night may defeat plans which have no fault except that they are too deliberate; how fleeting may be the chances of defeating the enemy, chances which once missed may never recur.

Since the war many old opinions have been modified. There is now a strong feeling in favour of "decisive" ranges. But it is still of great importance that we should put the Principle of Never Losing Time in the forefront of our tactical thought.

Conclusion.

An attempt has been made to show that the Principle of Never Losing Time should be given a foremost place among any Principles of War which are adopted by the Navy.[1] The main foundation on which this contention rests is the special characteristic of naval warfare—the ability of forces to remove themselves from the board by retiring into defended harbours.

Of recent years there has been a tendency to believe that the official Principles of War,[2] with their implied claim to comprehensiveness, must necessarily be the best principles for all three fighting Services. But investigation shows that in earlier times such a deep and clear thinker as Clausewitz suggested no such claim for the principles and theories which he formulated. He realized that an all-embracing theory was too difficult of achievement, or at best would involve such intricate philosophical argument as to be of no practical value. Such principles as have been deduced in the past, though doubtless of some general application, have been founded on the experience of land warfare and selected for their usefulness in the conditions of the age. They have not been a complete framework for the whole art of war, even for the whole of land warfare, but more in the nature of "those prominent characteristic points which form the rules" of the "actor in war," and which at times "become the staff on which he leans."[3]

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[1] Although it does not affect the point under discussion, it is interesting to note that "not to lose time" was one of Clausewitz's four principles "for the attainment of these objects" (viz., the principal objects in strategy) in his instruction to the Crown Prince of Prussia in 1810-12. See Clausewitz "Summary of Instruction given to His Royal Highness the Crown Prince" (included in Vol. III of the English edition of 'On War').

[2] "Field Service Regulations," Vol. II (1929), p. 6.

[3] Clausewitz, "On War" (English edition, 1911), Vol. I, p. 221. In spite of being somewhat clumsy when translated into English, the first paragraph of Chapter XIV, Book III, is perhaps as good a definition as there is of a principle of war in the sense in which this phrase is used to-day.

In a recent study of the official Principles of War, Sir Frederic Maurice definitely repudiates the claim that these principles are either immutable or comprehensive.[1] He justifies the present list on the score of the present conditions of warfare, and one notes that these are conditions of land warfare which in many cases are not applicable either to the sea or the air.

If then one takes the view indicated by Clausewitz, and confirmed by Sir Frederic Maurice, that a comprehensive list of the principles of all warfare is out of the question, it is difficult to see how the Navy and Air Force can long refrain from selecting for their own use such principles as shall be of especial value in their training and best adapted to their needs. That the principles adopted by the three Services should, wherever feasible, follow the same lines, goes without saying; but that any one Service should cramp its ideas in the phraseology of another would be a great mistake.

There may be some who think that the importance of co-operation between the three Services—an importance which it is impossible to overrate—is best ensured by a rigid uniformity in these matters; but is not such a view too narrow? Outward conformity to words and phrases may easily cover a divergence of interpretation to suit the needs of a particular Service. Under such conditions uniformity may become more harmful than helpful. It is not in this way that co-operation will best be achieved, but rather by a comprehensive understanding of one's own principles, coupled with a real sympathy with the principles and points of view of the other Services. Wherever our principles are identical, co-operation is made easier; but where, owing to the different conditions of land, sea and air, our points of view diverge, let us realize and make allowance for this divergence rather than stifle it in a fixed form of words.

For war on land it may be beneficial to include the idea of "Never Losing Time" in the Principle of Mobility. For war at sea it is best that this idea should have a standing of its own.

[1] "British Strategy," p. 47.

A UNIVERSITY FOR THE SERVICES

By MAJOR W. E. BRITTEN, O.B.E., R.E.

> *" With regard to the question of a Ministry of Defence, there is not a sufficient body of common thought between the three Services to justify such a step here and now."*
>
> Sir Samuel Hoare in the House of Commons, December, 1929.

IN his thoughtful article in the August number of this JOURNAL, Wing Commander Leslie comes to the same conclusion as Sir Samuel Hoare, but he suggests a method by which this lack of common thought could be remedied in the course of about a decade by placing a number of picked graduates of the Imperial Defence College on a " Combined Staff." From this Staff a supreme Head of all three Services could, ultimately, be chosen.

The idea is at first sight an attractive one, but, on consideration, it is a little difficult to visualize officers of probably forty years of age divesting themselves of the prejudices and predilections of their own Service, and emerging as something that is neither " flesh, fowl nor good red herring." It may be difficult to teach an old dog new tricks ; it is far more difficult to rid the genus *homo sapiens* of early ingrained bias, derived from his youthful days at Woolwich, Sandhurst, Dartmouth or Cranwell.

The trouble lies deep down in the fact that we have three Services whose officers do not speak the same language, and who have not spoken the same language since they were boys together at preparatory schools.

Two years ago the writer attended a conference of naval officers of the Mediterranean and Atlantic Fleets at Gibraltar. The two fleets had just fought their annual battle in the Mediterranean, and the conference was held to discuss the lessons brought out by the exercises. The staff work of the conference was excellent ; there were large-scale diagrams showing the position of the fleets at various times throughout the operations, and these were explained by the officers best qualified by their commands or positions at the time to bring out the lessons to

be taught. But from the first the writer found himself in deep waters, and as the conference proceeded the waters closed over his head and left him gasping for light and air. Later on, after the conference was over, he found a naval friend to explain to him some of the expressions and phrases used, and realized that once these were reduced to common terms, there had been nothing in the elementary tactics of the operations that he could not quite easily understand from the analogies of land warfare.

Doubtless a naval officer attending for the first time a divisional conference after army manœuvres would find himself equally at a loss, especially in these days of mechanization, despite the fact that inter-tank fighting must tend to resemble naval warfare.

It is not only in matters of strategy and tactics that these difficulties arise. In matters of administrative detail, the Services have different words to express the same ideas, different message and signal forms, different forms of official letter and memorandum. Thus, " other ranks will parade at 3 p.m." in peace-time army phraseology is " ratings will muster at 15.00" in naval language, and the writer has to confess to complete ignorance of the Air Force equivalent. Again, how many soldiers could explain what a Commodore was, or naval officers the difference between a Brigadier and a Colonel? How many junior R.A.F. officers would know what to expect of a D.A.A. and Q.M.G.? Countless examples of a similar kind could be thought of, but perhaps these are sufficient to show some of the difficulties that arise through want of a common language, or through lack of opportunity of acquiring knowledge of a " foreign " tongue.

How then can we implant a common language and common traditions at an age when the mind is most impressionable?

The answer suggested is a common " nursery," to which members of all three Services would go after leaving their Public Schools, instead of to Woolwich, Sandhurst, Dartmouth and Cranwell, as at present. It is not proposed to work out here details of such a " Service University," for many of these would be matters for experiment and compromise, but the broad outlines of the scheme might be:

(1) A common entrance examination on University lines.

(2) Entrance from the Public Schools at normal leaving age.

(3) A four-year course.

(4) During the first two years, trainees to be " Cadets, Genera Service," i.e., not detailed to any of the three Services.

(5) At the end of two years, Cadets to be appointed by examination and selection to one of the three Services " on approval."

(6) For the last two years, trainees to be paid as combatant officers, but to remain under training at the University. This half of the course would include short periods of attachment to all three Services during manœuvres, exercises, etc.

Specialist courses for all three Services, such as engineering, gunnery, etc., would follow, under arrangements made by the Service concerned. These would not be taught at the University, which would supply a good general education on University lines. Thus the chief subjects taught would be English, history—naval and military, mathematics, modern languages, the elements of tactics and strategy, based on the recognized principles of war, drill, physical training, and the elements of mechanical engineering. The instructors for the first two years of the course would probably be chiefly civilians but, during the last two years, Service instructors would deal with the application of the general principles above mentioned to the three Services concerned.

There are obvious advantages in such a scheme. The University would be the foundation of a liaison between the officers of the three Services that cannot possibly exist at present, particularly between the Navy and the other two Services. An Army officer might, under present conditions, call upon every ship of the Mediterranean and Atlantic Fleets without seeing a single familiar face; in fact, if he had not previously during his service served at a naval port, and had no relations in the Navy, the chances would be against his knowing any single one of them. Under this scheme, however, he would know the officers in every ship who were within a couple of years of his own seniority, for they would have been at the University with him.

The scheme would also provide for a certain amount of elasticity in respect of the Service to which individual officers were appointed. Not all boys at the age of eighteen have made up their minds that they prefer any one of the three Services, and at the University, Cadets would be free to change their minds up to the end of their second year; there is no reason why in special cases changes should not be permitted even later in the course, where round pegs were obviously being fitted into square holes.

The chief obstacle to the scheme is probably the financial side. Apart from the capital cost of building the University, it may be argued that the taxpayer cannot afford to keep officers away from their units for an extra two years, as this would involve an increase of establishments all round. But would it? Many of the duties now performed by young officers of all three Services could probably be performed equally well if not better by the highly educated warrant, petty and non-commissioned

officers of the present day, and it is understood that recent experiments on these lines in the matter of Boards, Courts of Inquiry, etc., have been very hopeful.

On the other hand, a combined University would certainly cost less to run than the existing four training establishments. The first half of the course could perhaps be made to pay for itself. The good education and Service discipline would attract many parents who did not necessarily intend their sons for the fighting Services, just as West Point does at the moment. Thus, the fees charged for Cadets could be made to cover the cost of this portion of the course, and a refund of fees could be made to Cadets who finally entered the Services. Those Cadets who left at the end of the two years to take up a civil profession would be encouraged to join the Territorial Army, or its Navy and R.A.F. equivalents, and would probably form a useful source of recruiting for the commissioned ranks of those forces.

The other main objections that will be raised to the scheme are, firstly, the argument that the naval officer must be caught young, i.e., before he goes to a Public School. Many senior naval officers undoubtedly hold this view, but most junior naval officers to whom the writer has spoken are strongly in favour of the Public School entry, although they themselves have been to Dartmouth. The second objection will probably be that between the time of leaving the University and joining the "Combined Staff" suggested by Wing-Commander Leslie, an interval of twenty years will elapse, during which officers will forget the language and traditions of their communal upbringing, and will have reverted to pure types of their own Services. This is to a certain extent true, but only to a certain extent. There is to-day, for instance, far more common feeling, or "sympathy" in its older sense, between Gunner and Sapper officers than between these and other branches of the Service. It would be very difficult to deny that this is due to their early years together at the "Shop."

It would, of course, be necessary to keep up this liaison during the twenty years in question by periodic attachments to the other Services, in *executive* capacities where possible. There is no great difficulty in this, given the will on both sides. It has been tried out in the attachment of young Sapper officers to infantry on manœuvres (where they have commanded platoons with considerable success), and it has probably been tried in other branches of the Services also.

As regards a "common language," or at any rate a familiarity with all three "languages," it is suggested that this can be obtained in part by the methods outlined above, but chiefly by further amalgamation in peace time of the administrative services such as Supply, Works,

Ordnance, Pay, Medical and Chaplains Departments. There can be little doubt that the naval and military medical officers who have served in any of the combined hospitals have gained very valuable experience of the administrative working of the other Service, and it is believed that the financial adjustments necessary have not offered any very great difficulties. It is also for consideration whether a combined Signal Service will not soon be a necessity, in view of the ever increasing importance of wireless.

The "Combined Staff" must of necessity include departmental staff officers representing the above mentioned administrative services, and the training of these officers can only be effected in administrative departments combined under one head. Thus, at Malta and similar stations where all three Services are in being, there might be a combined Supply Office, a combined Works Department, a combined Medical Service, and a combined Pay Office, etc. Each might have to be internally divided into three branches, one for each Service, but the chiefs could in turn be naval, military and air force officers, candidates for, or graduates of, the "Combined Staff."

It would, of course, take some years to get these schemes working, and it would probably be ten or fifteen years before the first results were visible, and, as Wing Commander Leslie says, another ten years before the "Combined Staff" could produce an officer fit to be the Chief Staff Officer of all three Services, but it is suggested that only by some such means will full co-ordination and a proper balance between the three Services be obtained.

DISARMAMENT AND ECONOMICS

By MAJOR B. C. DENING, M.C., R.E., *p.s.c.*

TO the fighting Services the question of disarmament is, for a variety of reasons, a matter of vital and continuing interest. The conclusion of the Five Power Naval Agreement provided a landmark on the road to disarmament. It is, consequently, now desirable to consider what further progress is likely to be achieved in this direction, since British statesmen, in particular, have emphasized that the London Naval Agreement is but a beginning of the work it is hoped to accomplish at Geneva.

It has been apparent for a number of years that public opinion in most of the larger countries has been swayed on the subject of disarmament by two considerations. On the one hand there has been, especially in Europe, a strong sense of insecurity, fostered by a variety of causes, which has led to an expenditure upon armaments as a whole on a scale larger than was the case before 1913.[1] On the other hand, there has been felt in many countries an unprecedented financial stringency and economic distress, which have forced governments, willingly or unwillingly, to curtail their armament programmes.[2]

These two influences, fear and economic want, have tended to balance one another. In some countries, the economic aspect has focussed attention at the expense of the defence aspect. In most, considerable sacrifices have been made to maintain the forces thought requisite for safety. Others again, to judge by their budgets and the speeches of their spokesmen, are only waiting for a period of prosperity to add extensively to their armaments.

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[1] In an article in the London *Economist* of 19th October, 1929, Mr. Jacobson formerly a member of the Economic Section of the Secretariat of the League of Nations, writing on armaments in Europe, states: "If the amounts spent by Germany are deducted, the totals for the other countries are:—Pre-war, £386 millions; post-war, £487 millions. These figures mean that European countries other than Germany devote to armaments almost as much in real values (account being taken of the rise in prices) as they did before the war, and considerably more than their average expenditure in the period 1909–1913."

[2] Great Britain has suffered continued unemployment and high taxation. Both France and Italy have experienced sudden deterioration in the value of their currencies. Italy also has a perpetually adverse trade balance. Russia has felt the lack of capital, and in the East, Japan has had prolonged financial anxieties.

It is obvious that disarmament and economics affect one another in various ways, though probably more in a psychological sense than in reality. A country economically well off should be able in theory to regard expenditure upon armaments with greater equanimity than one not so well off. In practice this is not shown to be the case. Both Great Britain before the War, when relatively wealthy, and the U.S.A., recently, have shown the greatest disinclination to vote defence budgets at a time of national expansion and prosperity. Secondly, moneys saved upon the defence forces in theory lessen the burden upon industry. As a result of the recent Naval Treaty, President Hoover says his country will be saved 200 million pounds in reaching parity, while the First Lord of the Admiralty puts the British saving at about 65¼ millions. Actually it is doubtful how much real economic gain is attainable. The abandoned naval construction affects many industries and causes unemployment, which has to be paid for. In theory and in the long run, the country's effort used in the creation of unproductive instruments of war can be diverted to making productive articles. In practice, in view of the existing slump in manufactures, this diversion probably does not take place to any great extent; there are simply more unemployed. Except in small countries in which the defence costs represent a large proportion of the national expenditure, it is certain that the influence of a few armaments more or less upon the economic situation is much exaggerated.

Where disarmament undoubtedly can affect the economic well-being of people is in the larger field of general disarmament. It is an arguable question whether armaments tend to produce wars or whether their existence prevents hostilities. When countries compete in armaments, as before 1914, there is great danger of one or more of them taking advantage of a temporary superiority to bring on war. On the other hand, a country (or empire) of great richness with no means of protecting itself is also inviting attack. But if a degree of disarmament can be attained whereby countries need neither feel threatened by the existing armaments nor be placed in a position of such weakness as to encourage aggression, then presumably wars will become unlikely. In that case the economic outlook will be greatly improved. For obviously it is actual war, with its colossal and wasteful expenditure, which is economically so expensive, rather than the day-to-day process of creating armaments. Disarmament plans, therefore, can radically affect economics in so far as they concentrate on preserving the peace and possibly the *status quo*, rather than on wide reductions.

Just as disarmament affects economics, economics in their turn may govern disarmament. The fundamental instinct in man is his desire to live and to enable his dependents to live. If this chance of existence

—and nowadays a high standard of existence—is threatened, man will immediately re-awaken the savage dormant within him, and will fight for his existence, no matter what height civilization may appear to have been reached. In other words, if the economic situation of a nation becomes hopeless, it will take to arms rather than go down economically, unless other means can be found to help it. It would seem that real progress in disarmament can never be effected until the economic well-being of nations in general has first been ensured. It is no doubt partly with this object in view that M. Briand has devised his scheme for the " United States of Europe," for while countries are greedily watching each other's coalfields, colonies or other sources of economic wealth, what hope can there be of security or of a reduction in their armed forces. The League of Nations is also examining the possibilities of general tariff truces and economic co-operation.

Undoubtedly there is already a tendency in big industries to work internationally rather than nationally. The world has already been divided up as far as the big oil, chemical and gramophone industries are concerned, to mention only a few. Certain big firms now co-operate to their mutual advantage,rather than fight, in order to buy raw materials, manufacture, sell products, etc., in those parts of the world in which it is economically best to do so. In this way wasteful competition, and thereby waste of any description, are reduced to a minimum, to the benefit of all concerned. The organization of the whole production of the world, as opposed to that of certain particular industries, would appear to be the end in view, if there is to be economic peace, with no more big armaments and no more war.

The question is whether such an ideal can ever be attained. The conditions to-day show such a serious state of affairs in many countries that these countries may be forced to accelerate the process of co-operation if they are not to be forced into economic war accompanied usually by increased armaments. In the past year Great Britain's unemployment has risen to phenomenal proportions, increasing by some 30 per cent. in a year to a total exceeding 2,000,000. Germany's unemployed were stated by the Prime Minister in May last to have risen in the previous year from 1,700,000 to 2,700,000, while the U.S.A. have now between five and six million unemployed. Mr. Snowden in the same month referred to the unemployment problems of Japan and Australia. Italy has for many years felt the pinch of a largely increasing population, combined with a recurring adverse trade balance. All countries dependent for prosperity upon manufactured exports have in fact been badly hit recently, and all are examining and re-examining the available markets of the world with a view to ousting some competitor.

If it be accepted that extensive disarmament can only follow economic peace and not precede it, the future of world economics must be of constant interest to all far-sighted governments. To forecast the course of economics is an impossible task; the few men able to do so become magnates and millionaires. It will suffice here to note that the era of perfection, as far as world economics are concerned, is as far off as ever, and that with the increasing world population many thorny problems remain. It is true that Great Britain, Germany and Italy, countries whose birth rate dropped heavily during the war years and whose working population now, sixteen years later, will not be augmented for some years by the usual increment, will soon have their unemployment eased; but the relief is likely only to be temporary, and does not help countries such as the United States and Japan. It is true, too, that the British Empire may find a remedy for itself in the economic organization of the Empire, but that solution may only intensify the difficulties for the rest of the world.

The conclusion remains that disarmament and economics are vitally interdependent, and that general disarmament can only follow general economic contentment, which is again dependent upon world-wide co-operation. When the attempts at co-operation within the British Empire are examined, where the component parts under one Crown may be only too anxious to help one another, and we see the difficulties owing to divergent economic interests which arise even amongst such a circle of friends, it is easy to appreciate the obstacles facing any attempt at world wide co-operation between strange peoples and races. The time has not yet come when individuals or peoples will give up something that they have for the general good. Until then it would seem there will always be peoples in want, supporting their wants by armaments.

THE CHANGE IN THE NAVAL SITUATION

By Admiral Sir Richard Webb, K.C.M.G., C.B.

On Wednesday, 29th October, 1930, at 3 p.m.

The Viscount Chelmsford, P.C., G.C.S.I., G.C.M.G., G.C.I.E., G.B.E., in the Chair.

The Chairman, in introducing the Lecturer, recalled his distinguished career, and the exceptional facilities he had had as Director of the Trade Division at the Admiralty during the War, as Assistant High Commissioner in Constantinople after the War, and when in command of the Royal Naval War College, to appreciate both the diplomatic and professional aspects of the subject with which he was going to deal.

LECTURE.

In approaching this very comprehensive subject it is as well to get clearly in our minds exactly what we mean by the Naval Situation. If there was one lesson more than any other which was brought out by the War it was the fallacy of thinking solely in terms of whatever Service was under consideration. The Navy, the Army, the Air Force are interdependent, and to endeavour, as for example at Gallipoli, to try and carry through any great operation of war with one Service while ignoring the other is merely to ask for trouble and to get it in full measure. Hence the Naval Situation can only be considered as one part—albeit an intensely important part—of any operation of war in which we might find ourselves engaged.

With this in our minds let us look at the duties which the Navy is called upon to fulfil to-day and compare them with those of pre-war days. We see at once that, fundamentally, the situation is unchanged. Now, as then, the function of the Navy is to secure our lines of sea communications, so as to enable us to ensure safe transport for our troops and supplies overseas, while denying that safety of transport to the enemy.

Such was, in brief, the function of the Navy in Nelson's day; but Nelson's chief anxiety was not that of ours to-day. His principal preoccupation was, firstly, the prevention of an invasion of our shores and, secondly, the stoppage of the enemy's oversea supplies. We were largely self-supporting, and certainly not so dependent as we have since

become on our oversea supplies. Nowadays, as all the world knows, we are dependent on overseas supplies for more than 70 per cent. of our foodstuffs, and for a still higher percentage of our raw materials. That dependence increases year by year as our population increases and our cultivated areas shrink.

But another factor in naval responsibility has come prominently forward ; the gradual supersession of coal by oil has entailed the building up of a vast fleet to bring that oil to our shores, and that fleet, no less than the food fleet, will need very careful protection on its way. So long as we are unable to render the extraction of oil from coal a sound economic proposition or, alternatively, make economic use of coal in the form of powdered fuel, just so long must the Navy bear this added responsibility of safeguarding the transit of the country's indispensable requirements of oil, drawn from neutral, or possibly hostile countries, situated at considerable distances from these islands.

To these mainly naval responsibilities must be added those to which I have already referred, viz., co-operation with the Army and the Air Force, and the safe sea transit of our military and air forces and floating air bases overseas, while denying such transit to the enemy.

One further task remains : that of stopping the sea supplies on which the enemy is largely or wholly dependent for the prosecution of the war.

So much in general outline for the functions of the Navy which, while remaining constant in themselves, vary only in relative importance one with another. Now let us try and trace the changes which have taken place and which affect the Navy's task in carrying out its functions. In pre-war days we were somewhat inclined to dissociate the political and strategical sides of any problem. It is now recognized that in war the national or political object must be the first consideration, this normally being security for the nation and its interests. In order to attain this object we must have an aim, a military aim, which is primarily the destruction or neutralization of the enemy's forces.

It will therefore, I think, be convenient to consider our problem under two headings : (*a*) political, and (*b*) strategical, and see how the changes therein have affected the Naval Situation.

THE POLITICAL ASPECT.

Prior to 1856, naval war was waged without any special consideration for international pacts or agreements. Each country laid down its own code, and its Prize Courts administered Naval Law to the best of their ability in conformity with what they took to be the Law of Nations. But the Crimean War revealed a great divergence of procedure ; and so we found ourselves saddled with the Declaration of Paris, which was

primarily an effort to bring English and French views into line, but which, in fact, only resulted *inter alia* in our surrendering our right to stop enemy goods in neutral ships going through to the enemy and cramping our power of blockade. It was, in fact, the first change in the Naval Situation, and perhaps the most far-reaching of all. Lord Salisbury bitterly attacked what he called our reckless utopianism in surrendering such valuable weapons, and pointed out that, whereas the English fleet had been a powerful instrument in hampering and ultimately subduing Napoleon, it was now valueless for any purpose other than the prevention of invasion. It is interesting to note that the United States withheld their concurrence, as they demanded a still more complete immunity of private property at sea in war: nevertheless the Civil War saw the Federal (Northern) Government strictly enforcing the stoppage of enemy supplies to the South. Their views as a neutral and as a belligerent were profoundly different.

The Hague Peace Conferences of 1899 and 1907 carried matters very little further. The latter was noteworthy for three things: firstly, for an attempt to set up an International Prize Court; secondly, for the British offer to abolish contraband, relying solely on blockade; and, thirdly, for the American re-statement of immunity of all private property. All these failed at the time owing to inability to obtain a unanimously favourable vote: the first is now with us, the second is in a state of suspended animation, and the third reappears from time to time under the somewhat misleading name of the "freedom of the seas."

It was because it was felt that the Hague Conferences had left important matters connected with sea warfare very vague, that the London Conference was called in 1908. That Conference produced the Declaration of London in 1909, which was an attempt to codify International Law. The efficacy of this Declaration was soon put to a practical test. Although unratified it was adopted by the Allies in 1914. It failed to pass the test, and after some whittling down by Orders in Council was finally scrapped in July, 1916. But the Declaration of Paris still stood, and it was only the announcement by Germany early in 1915 of unrestricted submarine warfare which gave us the opportunity of torpedoing that Declaration—at least for the period of the War—by what was generally known as the Reprisals Order in Council of 11th March, 1915, whereby the Allies took power to stop all goods of enemy origin, ownership or destination.

Thus the War ended with the Declaration of Paris still in force and that of London safely interred. Now an entirely new phase was to commence—a phase marked by the advent of the League of Nations.

The second of President Wilson's famous Fourteen Points announced by him in January, 1918, claimed "absolute freedom of navigation upon the seas outside territorial waters, alike in peace and war, except as the seas may be closed in whole or in part by international action for the enforcement of international covenants." What was in the President's mind? The Allies did not know, but they pointed out that this clause "relating to what is usually described as the freedom of the seas is open to various interpretations, some of which they could not accept."[1]

Such was the state of affairs when it came to drafting the Covenant of the League of Nations, and this brings us to the next important factor in the Naval Situation. The sections which chiefly concern us are Articles XI and XVI. Article XI lays down that any war, or threat of war, whether affecting immediately any of the members of the League or not, is declared a matter of concern to the whole League, while Article XVI declares that any member resorting to war in disregard of its Covenants shall be cut off from "all financial, commercial or personal intercourse between the nationals of the Covenant-breaking State and the nationals of any other State, whether a member of the League or not."

This is, of course, a very serious matter for the Navy. Should we be engaged in what is called a League or Public war, the Navy will find itself called upon to institute a Blockade of the offending State more drastic than the world has ever seen. Contraband, neutrals, neutral rights, are all to be swept away, and the offending State's very breath is to be squeezed out of its body until it submits. It is sometimes argued that this pressure can be put upon the offending State without any declaration of war. How this is to be accomplished is not very clear, and the position of naval officers called upon to exercise such pressure in peace time would be difficult, to say the least of it.

But we cannot consider the Covenant by itself; it must be read in conjunction with the Kellogg Pact. Before we come to that, however, we must glance briefly at other pacts. Among these was the Geneva Protocol of 1924, declaring aggressive war to be a crime and demanding the unconditional submission of all disputes to arbitration, with all sorts of pains and penalties in the event of refusal. British opinion would have none of it, considering that too much stress was laid on the forcible sanctions which it contained. We felt that we could not tie ourselves to an undertaking that the British fleet would be used for purposes not clearly thought out and approved by Parliament. So the Protocol died, and in its place we had the Locarno Treaties: eight of them in all. These were signed in December, 1925. On 8th September, 1926, Germany

[1] "History of the Peace Conference," Vol. 1, p. 396.

entered the League of Nations, and on 14th September ratification of the Treaties followed. Of these eight Treaties it is only the first, the so-called Security Pact, which concerns us now. It was made between Great Britain, France, Germany, Italy and Belgium. By Article 4 Great Britain, in effect, undertakes to go to the support of Germany if she is attacked by France or Belgium, or to the support of France or Belgium if either is attacked by Germany. Thus we see that our fighting Services are definitely committed to an obligation to go to war in certain eventualities. "The British guarantee of the Western frontier, in effect, has made the Rhine the boundary of Great Britain. We have entered into a guarantee to go to war if it is violated, and it is putting it within the power of France, Germany and Belgium to say when we shall have to go to war on the Continent."[1] These Treaties are specially interesting in that they set out to guarantee security, and so inaugurate a new international policy based on that conception. In short, as Admiral Custance has said, the international meeting at Locarno seems to have adopted the idea that mutual security is the political object.

We are all familiar with the steps that led up gradually to the Briand-Kellogg, or Paris, Pact, which was finally signed on 29th August, 1928. This Pact went far beyond the Locarno Treaties in its scope. It—

(1) Condemned recourse to war for the solution of international controversies;

(2) Renounced war as an instrument of policy; and

(3) Agreed that the settlement or solution of all disputes and conflicts shall never be sought except by pacific means.

We must remind ourselves that the United States, as well as a few other countries, including Turkey, Russia, Brazil and Mexico, do not subscribe to the Covenant of the League of Nations, but they, in common with practically all other countries, have accepted the Paris Pact.

So far as the Naval Situation is concerned we see that this Pact differs fundamentally from the Covenant of the League and Locarno Treaty in that the question of force is not raised. Whereas the Covenant of the League of Nations contains in itself machinery necessary to investigate and, in certain cases, to enforce obedience by a defaulting nation, the Pact of Paris is only an affirmation lacking any means of enforcement: one is judicial and to some extent executive, while the use of armed force is clearly indicated; the value of the other is chiefly psychological. Moreover, the Covenant of the League, while enjoining on its members the pacific method of settling disputes, does leave a loophole for war in

[1] Professor Pearce Higgins: "International Law and Relations," p. 123.

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case pacific measures fail; whereas the Pact formula absolutely proscribes war as an instrument of policy.

A proposal has recently been made to "put the sanctions of the Covenant behind the Pact."[1] As it would fall to the British Navy to take the chief part in executing these sanctions by cutting off the trade of the offending nation with other countries, including the United States, we may, perhaps, feel thankful that the proposal has been turned down by the Assembly of the League, at any rate temporarily.

One further point must be considered before we leave the political side, for it is a point which may vitally concern naval officers in war time. On 19th September, 1929, Great Britain signed what is known as the Optional Clause: that is to say she accepted as compulsory the jurisdiction of the Permanent Court of International Justice in any disputes of an international character which may be submitted to it by nations, members of the League, which have signed the Clause. With the general question we are not concerned, but as regards naval action "Great Britain is now bound to accept the decision of the Permanent Court on any question involving the exercise of her belligerent rights, whether in execution of the work of the League of Nations or in self-defence under the Pact of Paris."[2] And so the naval officer, in carrying out his blockade duties, can no longer merely concentrate on keeping his action within the bounds of Prize Court requirements which are fairly well known to him, but he must also keep a wary eye on the Permanent Court of International Justice, before whom our own Prize Court decisions may be called in question.

THE STRATEGICAL SITUATION.

It is not necessary to go far back into history to realize that in modern times it is only very recently that there has been any real study of the strategical side of naval warfare. The old principles, hammered out by Anson, Hood, St. Vincent and others, brought to perfection by Nelson, and applied with such conspicuous success by the British fleet in the Napoleonic wars, came to be lost sight of in the long period of peace following Napoleon's downfall.

But thanks very largely to such thinkers as Admiral of the Fleet Sir Geoffrey Phipps-Hornby, Admirals Colomb and Mahan, Admiral Sir Reginald Custance, and others, a better appreciation of the functions of the Navy began to be felt. The first immediate sign was the Naval Defence Act of 1889, whereby a large and homogeneous fleet was created to replace the heterogeneous vessels then in service. A long stride

[1] *The Times*, 2nd and 3rd October, 1930.

[2] Pamphlet on the Optional Clause, by Professor Pearce Higgins, p. 15.

forward was taken by the Admiralty in 1902 when they issued, ostensibly for the information of the Colonial Conference then sitting, a Memorandum on Sea Power and the principles involved in it.[1] In this Memorandum is stressed the cardinal importance of maintaining control of sea communications. In order to achieve this they emphasize the necessity for the destruction of the fleet of the enemy as the great object to be aimed at, while having sufficient power available to carry on a vigorous offensive against the hostile outlying squadrons without unduly weakening the force concentrated for the decisive battle. From this their Lordships deduced the policy that " The strength and composition of the British Navy, or of any British squadron, depends, therefore, upon the strength and composition of the hostile forces which it is liable to meet."

It was no doubt in some part due to this exhaustive analysis of the functions of the Navy that the Admiralty decided to undertake a complete re-organization of the distribution of the fleet in 1905. All old and obsolete vessels were mercilessly scrapped—in all, some nine battleships, ranging from the old " Dreadnought " up to the " Sanspareil," ten 1st class cruisers, nineteen 2nd class cruisers, twenty-eight 3rd class cruisers, and a whole host of gunboats, sloops, etc., were removed from the Navy List by that " courageous stroke of the pen " of which we heard so much.[2]

A new and definite stage, said the First Lord, has been reached, marked not only by changes in the material of the British fleet itself, but also by the changes in the strategical position all over the world arising out of the development of foreign navies. He pointed out that the formation of the United States navy was only limited by the amount of money which the American people chose to spend on it ; the French navy, he said, stands as always in the forefront ; and he added " the new German navy has come into existence : it is a navy of the most efficient type, and is so fortunately circumstanced that it is able to concentrate almost the whole of its fleet at its home ports." Three homogeneous battle fleets, The Channel, The Atlantic and The Mediterranean, were formed. The Atlantic and Mediterranean each had eight, and the Channel twelve, battleships, and each fleet included a homogeneous cruiser squadron. The China Squadron consisted, as before, of five smaller battleships. The remaining cruisers working in extra-European waters were divided into three groups—(1) the Eastern Group, comprising cruisers of the China, Australia and East Indies Stations ; (2) the Cape of Good Hope Squadron ; and (3) the Western Group under the C.-in-C. North America and West Indies. Such, very briefly, was the

[1] Cd. 1597, 1903.
[2] " Brassey, 1905," p. 10.

new organization which, with various modifications, continued in force until the outbreak of war.

Another far-reaching decision was taken in 1904. A Special Committee on Designs, comprising seven Flag Officers and Captains and eight very distinguished civilians, was appointed to consider future designs of different types of fighting ships. As a result of their investigations we built the " Dreadnought " and " Invincible " and their successors. For good or ill, the all-big-gun ship had come to stay, and its effect on the building programmes of all the great naval Powers was profound. The " Dreadnought " herself was in commission early in 1907, while the first German ship of a similar type, the " Nassau," was not completed until 1909. Thereafter followed the feverish building programmes with which we are all familiar ; so that by August, 1914, England had in commission or building thirty-four modern battleships as against twenty German, and ten battle cruisers as against eight German.

Then came the Great War.

The conclusion of the War, which marked the disappearance of the German navy, marked also the rapid rise of that of the United States. The one dropped out of the picture ; the other came into the foreground.

In 1916, largely on account of Allied action in detaining American ships and goods en route to neutral countries contiguous to Germany, President Wilson asked Congress to authorize a very large addition to the American navy, including ten battleships, six battle cruisers and many smaller vessels. The entry of America into the War in 1917, and the urgent need for merchant ships and anti-submarine craft of all kinds delayed the execution of the programme. But when the war ended the programme was resumed, in order, as the U.S. Navy Board said, " to create a navy equal to the most powerful maintained by any other nation in the world."[1]

The years immediately following the War found three countries, England, United States and Japan, with naval forces considerably larger than those of any other Power. In the case of Japan a steady expansion of the fleet was in progress, and proceeded concurrently with the big building programme in the United States.

Meanwhile Great Britain's finances had suffered too severely in the War to allow her to answer adequately this challenge to sea supremacy. She practically stopped construction, and scrapped nearly 1,800,000 tons of battleships, cruisers and destroyers.[2] But in 1921, seeing the steady increase on the other side of the Atlantic, she again decided to commence building capital ships, and four improved " Hoods " were authorized.

[1] Report of Gen. Board of Navy, 24th September, 1920.
[2] " Round Table," 28th March, p. 224.

The trend of events was making it more and more evident that the Pacific was becoming the centre of international affairs in several important respects. In the first place, all the English-speaking countries, except the British Isles, were, broadly speaking, ranged round the Pacific, either directly or beyond the Indian Ocean, so that their shortest communications with one another lay across its waters. Secondly, it was the focus of almost all the under-populated areas of temperate climate into which the surplus population of the world would tend to flow: a source in itself of lively political friction. Finally, the Pacific was the inevitable theatre of competition, if there was to be competition, between the three chief naval Powers. Japan was already there, and the Suez and Panama Canals gave direct access to the Pacific for the navies of Great Britain and the United States.

The elimination of the German navy with the consequent cessation in naval development in France and Italy had temporarily relaxed naval tension in the Atlantic and Mediterranean, while, conversely, the War had enabled Japan to take her rightful place among the naval Powers, with her home base in the Pacific.

Hence the Pacific was now the chief naval strategical arena in the world, and, having regard to the fundamental importance of the sea highways of commerce, it was evident that, in the ordinary course of events, the next international situation of a naval character which might arise would be located on its waters and round its coasts.[1]

The questions, therefore, of the steady increase in naval armaments, on the one hand, and of the growing strategical and political importance of the Pacific Ocean, on the other, were daily becoming more intense. The United States, as the nation which was taking such a lead in naval expansion, was the one best suited to take up the matter. Accordingly, on 11th August, 1921, the Government of that country invited the four other principal naval Powers; Great Britain, Japan, France and Italy, "to participate in a Conference on the limitation of armaments, in connection with which Pacific and Far Eastern questions would also be discussed."

At the time the invitation was issued, the British Imperial Conference, which meets every few years, was sitting in London. In anticipation of the Washington Conference they passed a resolution implying acceptance of the standard of equality between the combined naval forces of the British Commonwealth and the navy of any other Power.[2] Now this in itself was a profound modification of the Naval Situation. It was nothing less than a voluntary laying down by Britain of the "trident" which she had held since the XVIIIth century, when France, or rather

[1] "Survey of International Affairs, 1920–1923," p. 419.
[2] "Naval Disarmament." Latimer, p. 4.

Louis XIV, ignoring the advice of Admiral Colbert and others, had deliberately turned her face from the sea and had proceeded to use all her wealth to build up a great land empire, leaving that " trident " in the hands of her rival and neighbour. " Not all at once," says Mahan, " but very rapidly, England pressed into front place as a sea Power."[1] It was that front place which we now definitely relinquished, and however inevitable it may have been, it marks for naval officers a supreme change in the war strategy of the fleet.

Another and more immediate change was also to come. Before the Conference assembled there had been constant signs of friction between England and the United States on account of the Anglo-Japanese Alliance which, commencing in 1902, had been renewed for a further ten years in 1921. It is not our immediate concern to examine the pros and cons of this Alliance. It had withstood the tests of peace and war, and withstood them well, but it had to go, and in its place was evolved the Four Power Treaty between Great Britain, the United States, France and Japan. Under the latter, these parties mutually agreed to respect their rights in relation to their insular possessions and insular dominions in the Pacific Ocean, and to hold conferences and consultations as necessary should any disputable points arise. Finally, this Treaty contained a provision that, on its ratification, the Anglo-Japanese Alliance would be terminated, a provision which was, of course, the essence of the new instrument.

This naturally involved a modification of the strategical situation in the Pacific so far as we were concerned ; for, with Japan no longer an ally, though still a sincere friend, account had to be taken of menaces to British shipping which might now arise in waters hitherto covered by our ally.

Now to return to the Washington Conference. The invitation, as we have seen, had a naval side and a political side. The declared object was, in its naval aspect, to stop the race in competitive building of warships, while politically it was desired to solve the problems of the Far East and the Pacific, which had become the central problems of international affairs. The result, as is well known, was a Treaty signed and finally ratified on 17th August, 1923, whereby Great Britain and the United States were allotted 525,000 capital ship replacement tonnage, Japan 315,000, and France and Italy 175,000 each. No capital ship was to exceed 35,000 tons or carry a gun of more than 16-inch calibre. Similarly the figures for aircraft carriers were 135,000, 81,000 and 60,000, no carrier was to exceed 27,000 tons. No cruiser was to exceed 10,000 tons or to carry a gun exceeding 8-inch calibre. No

[1] " Influence of Sea Power upon History," p. 170.

merchant ships were to be prepared for the instalment of armament other than a stiffening of decks for guns not exceeding 6-inch calibre.

As regards the political side, the meridian of 110° East Longitude marked the western limit of an area in which, broadly speaking, the *status quo* as regards insular defences and bases was to be maintained; in other words no new defences could be established other than on the main lands of the countries concerned.

We have seen what the decision of the Imperial Conference meant to our sea power. Now, for the first time, limits were laid down which certain ships were not to exceed. Hitherto ships had been built, or should have been built, to comply with the demands of the service on and for which they would be employed. Now that was all to be changed. For the first time since Britain became a Sovereign State she definitely renounced her Sovereign right of sole decision as to the fighting powers of her ships of war. Naturally, having been given a maximum, every one proceeded to build up to it. It was no longer a question of adapting the vessels to the strategy, but the strategy to the vessels. But, so far, no agreement had been reached as to numbers of cruisers or as to numbers or sizes of submarines.

In the interval of time which elapsed between the ratification of the Washington Treaty in 1923 and the calling together of the London Naval Conference in 1929 several endeavours were made to tackle the disarmament question, but as none of them came to anything and their effect on the Naval Situation was therefore *nil*, they need not detain us long.

First there was the Hague Conference of 1922–23, which endeavoured to take on the question of new agencies of warfare and how they might be suitably controlled. As regards submarines it was soon found that "visit and search" was interpreted so differently in various countries that no agreement was possible; so the subject was dropped, though the rules for aircraft were very closely studied.[1]

Then there was the Rome Conference of 1924, which was noteworthy as having included a Russian delegate who, *inter alia*, demanded 400,000 tons of capital ships: considerably more than Japan. This Conference was a meeting of Staff and Government experts without any political objective to guide them, and was foredoomed to failure.

Next the League of Nations appointed a Preparatory Commission which was to deal with the technical questions which would be involved in a General Disarmament Conference to be held next year. Their interim report was not very encouraging. Meanwhile England and

[1] Moore: "International Law and Some Current Illusions," p. 205.

France had got together and made an attempt to draw up a Naval Conference Agreement which should suit all countries, but it met with such suspicion that it had to be dropped.

Lastly we had the Three Power Conference at Geneva from June to August, 1927, which endeavoured to extend the ratios of the Washington Treaty to apply to auxiliary vessels, i.e., cruisers, destroyers submarines and vessels of negligible combatant value. This Conference, to which France and Italy declined invitations, endeavoured to find some formula whereby Great Britain and the United States would have " parity " as regards the three classes of vessels. It failed, very largely because of the difficulty of equating cruisers needed for the protection of Great Britain's world-wide trade with those which the United States considered necessary for her status as a great naval Power. The reason for the breakdown, said the First Lord, was that although we agreed on equality we could not find a formula for it. Two points are, however, worth noting. One is the British proposal to reduce the maximum size of battleships to 30,000 tons and the calibre of guns to 13.5-inch. Secondly, the British statement that British needs in cruiser strength were " absolute," governed as they were by their essential duties for the protection of Imperial communications, and so were not relative to those of other Powers. The American delegation was unwilling to admit the principle of absolute needs as the basis for fixing the ratio. In other words the naval war strategy of the two countries was fundamentally different.

Meanwhile Statesmen continued their efforts to bring about disarmament, and so modify still further the Naval Situation. Within twelve months of the close of the Geneva Conference the Kellogg-Briand Pact was signed in August, 1928. The following March saw the change of President in the United States. This was followed shortly by an announcement at the Preparatory Commission for the Disarmament Conference that the United States Government was disposed to give full and friendly consideration to any supplementary methods of limitation of naval armaments which might be acceptable to other Powers.

And so we come to the Conference which finally evolved the London Naval Treaty of 1930. It is quite unnecessary for our purposes to go closely into the numerous conversations, compromises and calculations which led up to the signature of the Treaty.

France and Italy were unable to agree as regards some important objects of the Conference : accordingly the Treaty falls into two sections. One section, Parts 1, 2, 4 and 5, was signed by all five countries. In it the Powers agree not to exercise their rights under the Washington Treaty to lay down any more capital ships before 1936 and to scrap

certain older ones, thus bringing our quota down to fifteen. There was some re-arrangement of aircraft carrier tonnage; submarines were, generally speaking, not to exceed 2,000 tons; while in the case of small craft no restrictions were placed on surface vessels under 600 tons, and those between 600 and 2,000 tons were unlimited in number but somewhat restricted in armament (four 6-inch) and in speed (20 knots), no torpedoes being allowed. There was a re-affirmation of the use of the submarine to conform to the same rules of International Law as surface vessels.

There were, also, elaborate replacement rules; and, finally, it was agreed that the Treaty should remain in force until the end of 1936.

The other Section (Part 3) was signed by the British Empire, United States and Japan, and dealt mainly with cruisers, destroyers and submarines.

It will be recollected that the Treaty classifies cruisers into two sub-categories:—(*a*) vessels of about 10,000 tons armed with 8-inch guns, of which we are allowed fifteen, with a total tonnage of 143,500; (*b*) vessels of presumably smaller tonnage armed with 6-inch guns, of which we get a total tonnage allowance of 192,200, with an extra 19,220 tons if we avail ourselves of the permission to transfer that tonnage or less from the destroyer to the cruiser tonnage.

Nothing in definite terms is said about a total number of fifty cruisers, but if we assume that, eventually, our (*b*) cruisers are vessels of the very successful "D" class, i.e. round about 4,800 tons, we shall then get forty of them, making fifty-five cruisers in all; or sixty if we transfer tonnage from the destroyers. But our replacements are slowed down by the fact that we may only replace cruiser tonnage to the extent of 91,000 before the end of 1936. This, and the need for what the First Lord called "ships of greater radius of endurance than can be obtained with the smaller cruisers,"[1] brings us back to thirty-five 6-inch gun cruisers and the cruiser total of fifty ships.

As regards destroyers: our total permissible tonnage (150,000) gives us thirteen flotilla leaders of 1,850 tons, and eighty-four destroyers of 1,500 tons: more, of course, if we build smaller vessels, and less by about twelve if we transfer destroyer tonnage to cruisers.

The submarine situation remains virtually unchanged. A limit is imposed of 25 per cent. on the numbers of cruisers fitted with a landing-on platform or deck for aircraft. There is no restriction on flying-off arrangements, catapults, etc., for any ships.

[1] Hansard, 21st July, 1930, p. 1816.

Lastly we have the famous Safeguarding Clause, which authorizes further shipbuilding by any one of the three Powers should the building programme of any other Power or Powers appear to endanger national security.

Let us now glance at the British Navy as the Washington and London Treaties have left it.

Taking first capital ships. It has been well said that in reality construction is merely " applied strategy," and the underlying principle in the Naval Defence Act of 1889 was that the ships should be kept as small as possible having regard to the work to be done. But size gradually increased, each nation wanting to go one better than its neighbour. The " Dreadnought " quickened the pace until we arrived at the " Hood " of 42,000 tons, and planned improved " Hoods " of probably 50,000 tons or more, whose construction was stopped by the Washington Treaty.

That this huge tonnage was unnecessary was shown by the agreed reduction at Washington to 35,000 tons, and then by the British Government's suggestions, first at Geneva for 30,000 tons and 13.5-inch guns, and again last year for 25,000 tons and 12-inch guns. But why stop there?

The cogent arguments so clearly put forward by Admiral Richmond must be in the minds of all, and need not be repeated. They are, of course, conditional on general acceptance by all naval Powers. It is sufficient to say that, fundamentally, the capital ship must be of such a size as will enable her to deal effectively with the armed merchant ship. This implies good radius of action, gun power sufficient to overcome the merchant ship, speed sufficient to overtake her in all weathers, and resisting power sufficient to give a fair chance against surface, aerial and underwater attack. On what tonnage that can be done is a problem for experts: that it is by no means insoluble is amply proved by the German " Erzatz Preussen." " When the ships on each side are of the same size, what that size is does not matter."[1]

Meanwhile we are left with fifteen capital ships and a battleship holiday until 1936. Then the whole matter will have to be reviewed. A mutual general reduction would certainly be to the advantage of the British Empire; not only would a feverish new building programme be avoided but the money available for naval purposes could then be spent on the primary task of affording direct protection to sea communications, instead of tying up so much capital ship tonnage in the unproductive task of neutralizing the capital ship tonnage of the enemy.

[1] Admiral Sir Herbert Richmond in *The Times*, 22nd November, 1929.

Next as to cruisers. Lord Jellicoe speaking at Geneva in 1927[1] explained how the figure of seventy cruisers had been arrived at. Twenty-five were needed with the fifteen capital ships for fleet work, and twelve might be expected to be refitting or refuelling; this left thirty-three for 80,000 miles of communications, or one cruiser approximately for every 2,500 miles. He continued that on the outbreak of war in 1914 we had a hundred and fourteen cruisers. If this number proved inadequate can it be said that seventy is now excessive? In this connection it is interesting to recall that, but for the wholesale scrapping policy in 1902, many doubtless obsolete but still useful vessels would have been available.

No one—least of all I presume the Admiralty—imagines for a moment that if a minimum of seventy cruisers was strategically necessary in 1927, seventy cruisers are not equally essential now for the full and effective safeguarding of our routes. It is here that all those other considerations which we have been discussing at some length make themselves felt, and especially the Paris Pact. I think this is clearly shown by the Prime Minister's statement to the effect that the Admiralty's position was that under international conditions as they exist to-day, the number of fifty cruisers could be accepted for a strictly limited period, provided always that other Powers met our standard of fifty, and provided that in our number—that is in our fifty—there is a proper proportion of new construction suitable for extended operations.[2]

We saw that we could get about five more cruisers if we plunder the destroyer tonnage. But in regard to that it is impossible to forget how a shortage of destroyers for convoy work in the Spring of 1917 very nearly spelt defeat for the Allies, and our destroyer tonnage is perilously low already.

In the event of any considerable addition to the fleets of other Powers, what alternatives are there, short of invoking the Safeguarding Clause? Nothing, of course, of any size: but as regards auxiliary craft we saw that small surface vessels were subject to few if any restrictions. It has been suggested that one means of reinforcing our (*b*) Cruisers is by the construction of sloops, i.e. vessels of 2,000 tons and 20 knots speed armed with, say, four 6-inch guns, a catapult and two or three seaplanes. One can visualize many useful purposes both in peace and war for which these handy and inexpensive vessels might be employed, and two of them would be a match for one (*b*) cruiser. The obvious objection is that they could be easily outranged and sunk by

[1] *The Times*, 15th July, 1927.
[2] Quoted in Hansard, H. of L., 1st July, 1930.

(*a*) cruisers armed with 8-inch guns, but then so could (*b*) cruisers for that matter.

Similarly for destroyers; their place on detached service, anti-submarine work and so forth might to some extent be taken by those very handy little patrol vessels generally known as " P " boats. There are no restrictions for vessels under 600 tons, and a handy class of submarine chasers with a light armament and 22 knots speed might be revived and improved for work in narrow waters.

And now we come to an extremely important change which has taken place of late years in the Naval Situation. I refer to the advent of air power. It is almost impossible to overstate the importance of the air in naval warfare, and every year will see it coming more and more into the naval picture. Perhaps the least satisfactory feature is the aircraft carrier, offering as it does a huge target to hostile aircraft, surface vessels or submarines, and constituting an ever-present source of anxiety to a Commander-in-Chief. It is at best a makeshift and a severe handicap to strategical efficiency. What is the alternative for fleet work? The answer, I submit, is flying boats and catapults. In this connection it is interesting to note a recent American statement that " The near future will see the completion of more than fifty large patrol flying boats for the U.S. Navy,"[1] and also the fact, recorded by Brassey, that all U.S. capital ships and large cruisers carry one, or more often two, catapults and several aeroplanes.[2]

There is practically no phase of naval warfare in which aircraft cannot co-operate. With the fleet this is done in numerous ways, including scouting, spotting and aerial attack by bomb and torpedo. And if the enemy fleet is reluctant to come out and fight—" it is not extravagant to hope," says Air Vice-Marshal Sir R. Brooke Popham, " that by continuous attack with bombs and torpedoes, aircraft may in another war force the enemy fleet out of harbour, or else reduce it to impotence if it refuses to move."[3] Permanent air superiority to accomplish this is usually neither necessary nor possible; but a local and temporary superiority, a surprise attack, in fact, might accomplish much.

As regards our lines of sea communications there is, perhaps, apt to be some misconception. " I can see no reason," says Lord Jellicoe, " to think that surface vessels engaged in attacks on trade in open waters can be successfully countered by aeroplanes."[4] On the high seas, for many years to come, the ship must be the deciding factor: but invaluable help can be rendered by aircraft. One

[1] U.S. Naval Institute Proceedings, August, 1930, p. 695.
[2] Naval Annual, 1930.
[3] The Study of War; Edited by Sir G. Aston, p. 153.
[4] Brassey, 1926, p. 59.

can visualize small cruiser groups, each consisting of one or two cruisers (according to the size of the possible enemy) accompanied by a screen of merchant cruisers, all carrying catapults and reconnaissance aircraft. Such a force would be able to sweep very large areas and make the raider's task a hard one. In focal and terminal areas with flying bases in the vicinity, aircraft working in conjunction with surface vessels or as bombers, and flying boats with their great radius of action and offensive power, would render commerce attack still more difficult. There is, of course, the other side of the picture. Where our sea communications pass within the radius of enemy flying bases they would run far graver risks from air attack than was ever the case from submarines in the late war. The Air Ministry's task in protecting trade in such areas appears to me likely to be an extremely difficult one. Here again the answer would seem to be the indispensable flying boat operating from a not too distant first-class base. In view of the growing importance to the Empire of the flying boat, it is to be hoped that British flying boats will soon equal and excel all foreign types both in power and numbers. Every one of them will be of value in war time.

In regard to bases; with the exception of Singapore, there has been no important change, but with the increase in size and numbers of our flying boats, air bases for the protection of trade routes in narrow waters will become essential. The Washington Treaty having reduced Hongkong to a *status quo*, and it being very necessary to find some first-class base for a fleet operating in Far Eastern waters, Singapore was eventually decided upon. Many arguments, purely strategical, could be brought forward for an Australasian base, but these have been outweighed by other considerations, and a decision given in favour of Singapore.

It is in the defence of our oversea bases that we join hands with the Army. Indeed, without our garrisons, the bases themselves would be untenable, the fleet would be unable to operate, and the Empire would be in grave peril. Here, however, no change has occurred except that there is now an added air threat to our bases, and with it added co-operation with the Air Force becomes essential.

Now we are in a position to survey generally the change that has come about of recent years in the Naval Situation.

In the first place we see that the need for the security of our vital sea communications remains paramount. To insure that security our standard of naval strength was, up till 1914, the Two-Power standard.[1]

[1] Lord Beatty has told us that it was on that standard also—leaving the United States out of the picture—that we negotiated at Washington as regards capital ships, but that we could not, and would not, agree to a similar ratio for cruisers for all purposes. (*Hansard, H. of L., 1st July, 1936, p.* 189).

That Two-Power standard was needed to obtain security for the Empire as a whole, scattered as it is over the face of the earth. States were at liberty to build as much as seemed necessary for their security. We did not seek supremacy for its own sake. "It was not," says Admiral Richmond, "a mere lust of power which impelled our Governments to increase the Navy. It was the call for security of our interests."[1]

Now, as we have seen, that is greatly changed; financial and economic considerations as well as the Covenants and Treaties to which we have subscribed since 1918 have necessitated our viewing the problem of security from a different angle. Theoretically, if war now breaks out it must be a League war. Presumably we should be on the side of the League and should, therefore, have the advantage of powerful allies and of a strong moral position. If the League is enforcing its own Covenant it is not likely to be diffident about freedom of the seas, or blockade or anything else; and, as in the late war, it will fall to the British Navy to do the work. The same principle arises out of the Locarno Treaties. If they are applied, they are applied under the aegis of the League. That is the theoretical position. But what happens if the larger nations on the League are divided into groups, as in former days, and the smaller nations are so anxious to keep out of it that they hesitate to commit themselves? In such a case, as things now stand, all these pacts and agreements would be so severely strained that we might find ourselves back where we were in 1918. That is not to belittle the work of the League of Nations. M. Briand well said in 1928 "I consider it magnificent . . . It is still subject to criticism . . . But it constitutes for the first time in history a tribunal of peace among nations."[2] But those responsible for our vital sea arteries must not forget that the League still has a long row to hoe.

Or we might find ourselves attacked by some "rogue" among the nations and forced to defend ourselves. This means a war of self-defence, a so-called private war; an eventuality which pact and covenant admittedly have not yet made impossible. In such a war, and assuming the enemy has important oversea trade, it is hardly to be expected that any great sea Power would not make use of that power to stop enemy trade. One might as well, as Mahan pointed out, expect two contending armies to agree to respect each other's communications. It is an age-long right, and as much a part of war as battle itself.

Meanwhile, for good or ill, we have changed our Two-Power standard in all classes of ship to a One-Power standard, the standard being that of a great and wealthy country which could easily out-build us if she

[1] *Times*, 21st November, 1929.
[2] Speech in the Senate, 2nd February, 1928.

would, whose interests—liberty, prosperity, and peace—are fundamentally identical with our own, and with whom we are told war is unthinkable. If this be so, I submit it is equally unthinkable with the third great naval Power—Japan. Even supposing either country were so mad as to declare war on its late ally, the result would almost inevitably be a stalemate. We are not only an Oceanic Power in the widest sense, but also a European country with all Europe's complicated troubles and responsibilities at our door; that being so, to imagine that we are going to uncover the heart of the Empire and send our fleet thousands of miles into the Pacific with only one base, Singapore, for our supplies and damaged ships, is to write us down as something worse than fools.[1] Anyway the British public would never tolerate it.

We have seen how many of these pacts and treaties rely on the British Navy for stabilization. As Lord Lloyd recently pointed out, there is no other agency in the world whose influence and power to prevent war is comparable with it. It is largely on that stabilization that our security rests. In other words, as a distinguished Admiral has said, "Our security still depends upon a balance of power in Europe."

Such, in brief outline, is the record of the change which recent years have brought about in the Naval Situation. What does it mean to the Empire? For the moment, perhaps, there is no cause for undue anxiety as regards our naval forces. Our relative capital ship strength is but slightly impaired, and our cruiser strength only little more so; for instance, our strength in cruisers actually in service, in 1926 was 52[2]; in 1929 it was 54[3]; and the latter number must dwindle to 50 by the end of 1936.

But, what of the future? As a result of the War, the peoples of the world have set themselves to discover means to prevent another and still worse upheaval. Whether these means—treaties, covenants and pacts—will continue to prevail, no man can say; but in the meantime not only has Great Britain and the Empire become involved in commitments far in excess of those entailed by any previous alliances or ententes, but we, a Sovereign State wholly dependent on the sea for our very existence, have submitted to dictation as to the size and composition of our Navy.

[1] "Assuming," said Lord Beatty, "that we have this base and a situation arises which necessitates the moving of our fleet to the Far East, the least we could do would be to send an equality force, leaving an insufficiency to safeguard our vast trade through the Mediterranean and Home waters." And we have to remind ourselves that it was Nelson himself who said that only numbers could annihilate.

[2] Brassey, 1926.

[3] Cmd. 3464, 30.

Admittedly these pacts and treaties have as yet failed to make war unavoidable; we are still in what His Majesty's Government calls the transition stage.[1] The Paris Pact cannot prevent us from being involved in a war of self-defence, while the Covenant of the League, by its Article XVI, might involve us in a blockade of exceptional severity, wherein we might be called upon to cut off enemy supplies from neutral countries outside the League including the United States. In such a case of what use would be 70 cruisers—or 170 for that matter?

None the less there is undoubtedly a very general desire for "economy in armaments; and Parliament, Public and Press show an indication to favour a Treaty which seems to be a first step towards effecting such economy by international agreement."[2] We have been told of the millions which have been saved by the London Treaty, and of the resultant easing of international tension consequent on the elimination of competitive building in cruisers and auxiliary craft. That is all to the good, but three facts at least give cause for anxiety.

Firstly, in 1935, the situation will have to be reviewed; by 1936 the capital ships will be six years nearer their time for scrapping. Are they then to be replaced by vessels of anything approaching similar size? If so, one visualises a very big bill for new construction.

Secondly, as a European country with a huge stake in the Mediterranean, the abstention of France and Italy from any agreement as regards cruisers and destroyers, and their strong divergence of views on relative naval strength, must cause us much anxiety. It is true that in certain eventualities we have the safeguarding clause, but its invocation by us would spell suspicion and strained relations.

Thirdly, there is still much inflammable matter in the Balkans and further East, which might burst into flame at any moment. Can the League be depended upon to put its finger, by unanimous vote, on the aggressor, or shall we see once more a grouping of the nations?

Field-Marshal Sir W. Robertson, out of his vast experience, and with great truth, has told us that "upon the Cabinet devolves the responsibility for combining the whole military, naval, diplomatic, financial and economic forces of the nation for the defeat of the enemy."[3] But, while Cabinets come and Cabinets go, the task of maintaining and safeguarding those arteries along which flows the Empire's life-blood goes on. That task can be accomplished in two ways. One is by the abolition or outlawry—call it what you will—of war; the other is by the armed forces of the Crown.

[1] Cd. 3485.
[2] R.U.S.I. Journal, Aug. 1930, p. 596.
[3] Soldiers and Statesmen ii. p. 391.

Not until the first is an accomplished fact, can we, dare we, unduly weaken or impair the paramount weapon, the Navy, which has so often stood between the disturbers of the world and the peace of the world.

Economy is an urgent cry; we all admit it. The social services, the War debt, and other charges absorb huge sums. How best can we use the sum available for defence? So far as the Navy is concerned, I submit that we should strive whole-heartedly for the abolition, by mutual consent, of huge capital ships as we know them to-day—ships costly alike in construction and upkeep—and come down to a rational size of ship, adequate in every way for her allotted task. That task is to be able to meet in battle any possible adversary, and to render direct protection to our sea communications. Such an economy would be of benefit to all nations who are genuinely seeking security. Whether this is to remain an idle dream or become a practical possibility is a problem for the statesmen of the world to solve. Once again, the military aim waits upon the political object.

Officers in the fighting Services are often accused of sabre-rattling, and it was, I think, the late Lord Salisbury who said that we would not be satisfied unless we were given instructions to fortify the Moon in order to protect it against an attack by Mars. Whatever may have been the attitude of the Services then, I do not think that such strictures can apply now. The officer of to-day is fully alive to the responsibilities which rest on him in war time, but he asks no more than sufficient force adequately to fulfil those responsibilities. With all the experience of the late war fresh in his mind he certainly makes that request in no jingo spirit, for he probably agrees whole-heartedly with the king of olden times that "no one is so senseless as to prefer war before peace, since in the latter, the sons bury their fathers; whereas, in the former, the fathers bury their sons."[1]

DISCUSSION.

ADMIRAL SIR HERBERT RICHMOND: When one listens to the whole story, commencing with 1856, the way in which this country has gradually abandoned all those rights which have made her strong and great and important in the world, is to me quite extraordinary. The Declaration of Paris in 1856 was the first thing that cut down our power of acting at sea. Since then we have had a very considerable extension of the claim for what is called the "freedom of the seas."

FREEDOM OF THE SEAS.

A short time ago I spent a month in America; there I heard an extraordinary number of different opinions as to what is meant by those words. Nobody seemed to know; I do not believe anybody does know what is meant by them. But

[1] Herodotus (Laurent's translation) p. 43.

I noticed that both among the international lawyers, with whom I had a considerable number of discussions, and also among American naval officers, there was not that fervour for the "freedom of the seas" which one sees expressed by those publicists who are imperfectly acquainted with the subject. I think one of the changes taking place in the Naval Situation is a change in outlook on that side of the water on this problem of the freedom of the seas.

Codification and Security.

Another direction in which great changes have taken place is in regard to the present tendency towards codification. Codification is, in my opinion, one of the most difficult things in the world to carry out. There is no codification in the case of the law of England, but, in spite of our experience of the fruitless attempt to codify international law in the Declaration of London, we have recently heard a great deal about the codification of international law. Anybody who sets out to codify international law is going to get himself into a mess compared with which the Declaration of London is a perfect paradise.

But this craze for codification has not confined itself to law; it has gone further. We are now trying to codify navies. Categories have been laid down, and wonderful mathematical calculations made, for the purpose of determining strength at sea. Personally, I think all these are as utterly unscientific as the other attempts at codification. As I see it, there is only one reason for a navy, namely security, and one basis for its strength, namely such as will give you the security that you require.

About ten years ago the statement was made in certain foreign quarters that just as in an army there are proper proportions of cavalry, artillery, and so on, to other arms, so at sea proportions could obtain in fleets for battleships, cruisers, etc. To anybody with the smallest acquaintance with naval war that statement is, of course, perfectly ridiculous. So far as the cruisers employed out and beyond the fleet are concerned—I do not speak of those acting as auxiliaries to or portions of a fleet—you will find their numbers are and always have been solely and entirely based on the number of positions in which they are required to be and the work they have to do. That principle of the determination of naval strength has been departed from, and arithmetical formulæ have been adopted which bear no relation whatever to the problem of security. That is a change to which we want to give very considerable attention.

Another point in regard to this codification concerns the number of destroyers which, under this new principle, we are to be allowed to have. The destroyer is the modern analogy of the small frigate, and recalling the work the former had to do in the late war we are reminded that a very large number of them was required for all the numerous services of protecting the lines of communication. If you take any narrow waters through which British trade and communications pass, you will find that many of them are flanked by bases in which there are flotillas of foreign destroyers. Where there is a possibility of attack by ten, twelve or fifteen destroyers, I should be very interested to know in what manner protection can be given against that familiar form of attack, with the very restricted programme of destroyers allowed us at present.

Parity of Security.

Next comes the question of these "ratios" and "parity." People are beginning to realise abroad, though possibly not so quickly in this country, that all these ratios are entirely unscientific as far as the science of war is concerned. I notice writers in America are taking this view, and Professor Shotwell had some interesting

articles in the *New York Times* last March in which he threw considerable doubt and cold water on the validity of these doctrines. He even went so far and was so heretical as to say that the parity which should be aimed at is not the parity of tonnage, for which all the mathematicians have been striving, but the parity of security. The French writer, Pertinax, recently, said very much the same thing. Naval strength is not measured merely in tons; it is a matter of positions and many other things. There would certainly not be parity between this country and one of her neighbours if we had equal strength at sea; it would simply mean the inferiority of this country.

Whether any of those ideas will bear fruit between now and 1935, when the position will have to be reconsidered, I do not know; but they are of considerable importance.

Contraband.

The Lecturer spoke about contraband in the next war and about a "League war" in which we may have to stop contraband. What is the meaning of the word "contraband?" In the past it meant weapons of war, and some the materials with which they are made; but now, if the League is the effective instrument which we all hope it is, contraband will cease to be particular articles; it will become the actual *act* of trading. Contraband in "private war"—if that distinction can be made—is a subject needing a great deal of thought; but I suggest, if the matter is examined from a strategical point of view, that it will be found to be less complicated than it appears.

International Agreements and Naval Strength.

Admiral Sir Sydney Fremantle: As regards these great international agreements, I should like to submit two propositions. One is that they have no bearing whatever on the strength of the Navy, for this reason; they may—I hope they will—reduce the chance of a war, but if a war does come about it will be just as intense as it would be without these international agreements.

The second point is, are we justified in taking them into consideration in connection with the naval situation? The lecturer has told us how at any rate two very important agreements, the Declaration of Paris and the Declaration of London, were practically abrogated during our recent experience of the Great War, but there are many other cases to which he did not refer. For instance—I speak subject to correction—but I think I am right in saying that on the one occasion on which, since the institution of the League of Nations, one of the Great Powers has been involved in the chance of war, the League had to beat a most undignified retreat when it tried to interfere. I refer to the incident when Italy was annoyed with Greece over some comparatively trifling incident in Albania. She did not wait for the League to assert itself, but immediately proceeded to bombard Corfu.

Again, take the second article of President Wilson's famous Fourteen Points, with regard to maritime communications being free outside territorial waters both in peace and war; why, round his own country they are not free in peace! He, or one of his successors, insisted on the limits of territorial waters being increased from three to twelve miles, but that was not enough; a ship was sunk seventy miles off their coast. Moreover, Mr. Coolidge and Mr. Hoover, in their Independence Day orations, both said they were not going to trust to international agreements; so long as human nature remained what it was, the chance of war must always be envisaged.

I could not help remarking with interest what Mussolini said the other day; he said "I repeat that so long as guns exist they will be more beautiful than beautiful but often vain words. When the word is alone sufficient to regulate the affairs of the nations, I shall say that words are divine."

Capital Ships.

The lecturer referred to capital ships. I, no doubt mistakenly, rather gathered his view was that the governing factor in the case of a capital ship was that she should be able to compete successfully with an armed merchant ship. I cannot believe I was right in thinking that was meant. Later on he referred to Sir Herbert Richmond's articles, and later still to the desirability, if we had to economise on the Navy, of economising on capital ships.

I am somewhat of a heretic about capital ships; under present circumstances I cannot see we want more capital ships than just enough to deal with the comparatively small capital ship strength of France and Italy. I cannot envisage capital ship warfare being carried on across the Atlantic Ocean or the Pacific Ocean. If we have to economise on naval strength, I think that there is a very good field for economy; but I should like to utter another word of warning. Though we may do away to a considerable extent with the capital ship, we cannot do away with the function for which the capital ship exists. The function for which the capital ship exists in this country is, briefly, to make security of the heart of the Empire absolutely certain. There are many areas in which naval war goes on in which some risk can be taken, and in naval war you can never get 100 per cent. security; but so far as the heart of the Empire is concerned, taking the case of the last war, it was the territorial security of this country which was the asset of essential value, and the capital ship existed in order to give us, as near as possible, 100 per cent. security in that respect. Her size may depend on the enemies she has to meet, but her function will always remain, and a capital ship force will always be required in addition to the number of cruisers required for the attack and defence of trade.

Destroyers.

I was very glad indeed to hear Admiral Richmond mention the important question of destroyers. During the last year of the War, we had 360 destroyers, and never, from the first day of the War to the last, did we have sufficient of them; yet we are now down to 110.

There is one thing we must do with regard to the strength of the Navy, and that is to make quite certain, whatever Government is in power, that we do keep them up to scratch to build up to the exiguous strength which is allowed us under the Naval Treaties. I hope we shall succeed in doing that, but it will not be too easy.

The Covenant and the Kellogg Pact.

Mr. Ronald Ross, M.P.: It seems to me that, to-day, the first line of defence of this country is no longer the Navy, but a series of treaties and international engagements. There is no harm in that; but we must examine it, and see how far we can count upon that defence, and how far we must ensure that the traditional policy of an adequate Navy to defend us in case that line breaks is properly carried out.

If you study Article 16 of the Covenant, to which the lecturer has referred, ou will find that it is not by any means clear, and it has become no clearer by the ratification or absence of ratification by various countries concerned. That is

one of the main features of the international treaties which defend countries from war.

Secondly, consider the Kellogg Pact. The Kellogg Pact contains no sanctions whatever; in fact, a sanction by force would be a contradiction of the Kellogg Pact. I should like to know how far, in the lecturer's opinion, the armed enforcement of League of Nations sanctions contradicts the Kellogg Pact, and the Kellogg Pact contradicts that enforcement; because the Kellogg Pact, as I understand it, renounces all war as an instrument of policy. Does that or does it not include public war under the League of Nations, to which body the United States does not belong?

THE LECTURER:

ADMIRAL SIR RICHARD WEBB, in reply, said: Admiral Sir Herbert Richmond referred in the first place to the freedom of the seas. I rather deliberately kept off that subject, because it is such a thorny one, and once one gets launched on it one never knows where one will stop. The freedom of the seas, to any naval Power, is a contradiction in terms; and whether we take Senator Borah's rendering of it: that everything is to be allowed to go through free except munitions of war; or whether we take the version given by President Hoover the other day: of allowing food ships to go through; whatever it is, we find it very hard to believe that any country with a large navy would, if it came to the point, allow the passage of supplies for the comfort of the enemy.

Then Admiral Richmond referred to the subject of parity. I think I used the word "parity" only once in my remarks, because I do not understand parity myself, and neither did any of the distinguished statesmen and naval officers at Geneva in 1927. You have only to read the remarks on the subject to see that parity was not translated by any two nations in the same way, and it was because they could not, as Mr. Bridgeman said, "find a formula," that the matter never got any further.

Admiral Richmond asks how, with our small destroyer quota, lines of communication are to be protected against raids by destroyer flotillas. The only answer, I presume, is convoys; I see no other way.

As Admiral Richmond says, the number of cruisers depends on the work they have to do. That, I think, comes to very much the same thing as the old Admiralty memorandum, which said it was to meet the ships of the enemy. That does not mean to say that, if the enemy has ten cruisers, ten will be sufficient to meet them; far from it, as we know from the late war; but I do not think that was ever in the mind of the Admiralty. The traditional role is not to act on the defensive, but to prepare to attack the force which threatens. It would be quite impossible to do that with parity or anything of the kind, and therefore obviously we should want a force considerably larger than that which could be brought against us.

With regard to Admiral Sir Sydney Fremantle's cogent remarks on the subject of international agreements, I suggest that they have to do with the strength of the Navy, in as much as they have increased the responsibilities of the Navy. What I have tried to bring out is the fact that these pacts and treaties rely on the British Navy for stabilization. So far from justifying us in cutting down the Navy or in any way limiting it by reason of these pacts, I think they have added most colossally to the task the Navy has to do.

In regard to the second of President Wilson's Fourteen Points; it is England really who is going back to the old freedom of the seas. As that illustrious lawyer,

Sir Francis Piggott, pointed out, there is one nation that really respects the freedom of the seas in peace-time, and that is England. The seas are not free round a great many countries; a British merchant ship may not engage in interport trade in any of those countries.

I had noticed those quotations from President Coolidge and President Wilson to which Admiral Fremantle refers, but for want of space I cut them out. They were both to the same effect. Both those men, pacifists heart and soul, on leaving office put it on record that they realised one could not get away from the fact that armaments are essential.

With regard to the size and function of the capital ship, Admiral Fremantle defined the function of the capital ship as being to make the security of the country absolutely certain. That is undoubtedly so, but is not that rather the political object than the military aim? The political object of the Navy is security; the military aim of the Navy is to destroy or to neutralize the ships of the enemy. If the ships of the enemy are no stronger than your own ships you have a good chance of annihilating them. No one supposes you are merely going to produce a ship capable of fighting a merchant ship and consider that that is sufficient. But you must start from some basis, and the one fundamental fact that you have to work from is the armed merchant ship. Working up from that, you will eventually, having allowed for certain measures of protection and certain measures of attack yourself, find some size which you consider suitable; it may be, as some officers say, 7,000 tons, or as others say, 10,000 tons, and as the Admiralty recently said, 20,000 tons.

I agree we never had sufficient destroyers during the war. In 1917 I suppose everybody in the Admiralty realised the only thing that could save the situation was the convoy system, yet we were powerless to bring in a convoy system because we had not sufficient destroyers.

To reduce, as we have now done, the destroyer tonnage is a very dangerous thing, and I cannot believe the Admiralty will ever plunder the destroyer tonnage, in order to give us a few more cruisers. It is a terribly difficult position for them, but I feel sure they will build up to the whole of the tiny quota allowed us, so that we shall be at full permissible strength.

Mr. Ronald Ross suggests that the first line of defence is no longer the Navy, but a series of pacts and treaties. I do not think one can go quite as far as that at present. As I have said, if and when war is outlawed or abolished, or whatever you like to call it, perhaps we shall have arrived at the millenium, and when that time comes we can beat our swords into ploughshares. But, as I said in my lecture, the League of Nations has still a very long row to hoe, and to imagine for a moment that these pacts and treaties are going to help the Navy and replace it as a first line of defence is to live in a fool's paradise.

The Navy must stand for the present. The Government themselves admitted the other day, in a memorandum presented to the Naval Conference, that we were at present in a state of transition from the old regime to that of disarmament, and I think that state of transition will see our lifetimes through.

How far, it is asked, do the League of Nations sanctions contradict the Kellogg Pact, and *vice versa*? With great respect to Mr. Ross, I think I must refer him to Lord Cecil! The whole question was thoroughly discussed at the League of Nations, and the whole matter gone into; and, as you will remember, there was a very strong effort made by Great Britain, backed up by China, to bring in the application of sanctions; that is to say, to put a sort of penal clause into the Kellogg Pact; but only England and China voted for it.

There was one other point: Admiral Fremantle thinks our capital ship strength should balance that of France and Italy combined; he wants to go back to the two-Power standard, and I am whole-heartedly with him. We want the two-Power standard, leaving America out of the picture; and the sooner we go back to that, the better for the British Empire.[1]

THE CHAIRMAN:

There are two observations which, merely as a layman, I should like to make. In the first place, surely it is a good thing for the public to see an Admiral carefully setting down the whole story of the present Naval Situation dispassionately, and plotting it out faithfully, not only from the naval aspect but from all its angles; and it is a good thing also, I think, for the naval officer to see that an Admiral can deal with this matter in this way; patiently unravelling all the threads—political, naval and economic—of this tangled skein which goes to make our present complicated naval situation.

The other matter is one which I am surprised no one has touched on, because it seems to me that it is embodied in the most pregnant sentence of his lecture to-day. He said "It is no longer a question of adapting the ships to the strategy, but the strategy to the ships." Before the war, when you knew in general outline what your future strategy would be, it was possible to build your ships up to the requirements of that strategy; but now you have exactly the converse case, for by pacts and other instruments your ships are limited in number, and the Admiralty have to think out what is the strategy that will have to be applied with that number of ships. I have never been able to be critical, therefore, of that multiplication of sections in the Admiralty which has led to a large increase in the office personnel, because surely it stands to reason that the smaller the fleet you have to deal with the more necessary is it to examine and to explore the ways in which that small fleet can be made as efficient as it possibly can be.

The usual votes of thanks to the Lecturer and Chairman were carried by acclamation.

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[1] Attention is invited to "The International Situation," p. 823 of this Journal. —EDITOR.

THE UNION DEFENCE FORCES OF SOUTH AFRICA

By Captain F. H. Theron, *p.s.c.*,
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I.—Introductory.

When the Dutch under van Riebeck first arrived at the Cape of Good Hope in 1651 the main problem of defence confronting the settlers was protection against the savage inhabitants of the interior, and this aspect of the problem has largely influenced its solution ever since. But because it is an important strategic point, the Cape has been the repeated objective of paramount naval power. Discovered by the Portuguese, settled by the Dutch, seized by the French during the Napoleonic Wars, wrested from them by the British, restored to the Dutch and seized again for the last time by the British in 1806, such has been its record as regards external aggression. To the settler, however, one form of Government has seemed as bad as another. Ever regarding it as oppressive he sought to escape the authority of Cape Town by migrating or "trekking" further into the wild interior. Being independent and self-reliant, these farmer, or Boer pioneers (*Voortrekkers*), evolved their own system of protection, which developed into the "Commando system," an organization excellently suited to their characteristics. This ultimately became recognized by the Dutch South African as his natural military organization, and he accepted all its responsibilities. Consequently in South Africa there never has been any question about compulsory service; it is simply accepted. On the other hand, it has been difficult to inculcate into the majority of citizens a realization of any obligation for naval defence.

The Commando system prevailed in the wars against the savage Zulu and Matabele, the cunning Basuto, and all other native races with which the Voortrekkers battled for existence. Finally they, a mere handful of Europeans, were victorious. No wonder the Boer clings tenaciously to a system round which some of the finest traditions of his past are gathered. If the system failed against disciplined troops, as in the Anglo-Boer War, he consoles himself with the memory of Colley's defeat at Majuba in 1881, the liberation of the Transvaal from the British, and the fact that even in the Anglo-Boer War it took an overwhelming force two and a half years to subdue him.

The essence of the present-day problem accordingly is this: to take what is best and acceptable to all in the traditional life and customs of

the people, very gradually—for we are a most conservative people—to evolve a system that will secure the State against all internal trouble, and also raise the most formidable obstacle possible against foreign aggression.

II.—Historical.

Until well into the XIXth century the settlers had to protect themselves only against roving bands of Hottentots, who were not always hostile, and the incessant menace of marauding Bushmen with their poisoned arrows. The Hottentot was easily subdued, and he attached himself to the household like any animal that has become domesticated: but with the Bushmen it was a question of kill or be killed, so he was exterminated like any other vermin. Then, a hundred years ago, about the time when the expansion of the pioneer Boers North-Eastward met the advance of the Bantu (Kaffir) tribes moving South-West, the limit of patience with the Cape Town administration was reached. The Boers decided to free themselves from British allegiance, and in 1832 there began the great trek Northwards through what is now the Free State and Natal. They travelled with their families, herds and all their worldly goods. When danger from hostile natives was expected they formed their waggons into a fort (*laager*) with families and cattle inside. In the event of an attack the women often assisted the men by loading the old muzzle-loaders. If the enemy was too strong, several laagers combined to offer a concentrated force against them—as was done under the valiant Pretorius when the power of the Zulus under the bloodthirsty Dingaan was broken. The trek was virtually a crusade in the course of which Natal, Orange Free State and the greater part of the Transvaal were settled.

The military machinery which had served so well during the Great Trek was frequently called into action during the early days of the young States. Its basis rested on the Commandant and Field Cornets elected by a district. Each man in time of peace trained daily and automatically as a horseman and rifleman, since the horse was his only means of locomotion, and game his principal meat diet. In time of war every citizen, or burgher, was mobilized, i.e., "commandeered," and had to appear mounted, armed, and carrying three days' provisions, all at his own expense. At the head of this military organization stood the Commandant-General, the right hand man of the President and elected by the people. A military constabulary, the Zarps in the Transvaal, and permanent batteries of artillery equipped with Krupp guns, all organized by Dutch and German officers, were subsequently raised. Such, together with expensive forts built round Pretoria after the Jameson Raid in 1896, was the defensive organization of the two Republics in 1899.

In the Cape Eastern Province the burden of subduing the Bantus was undertaken by the British military authorities in a succession of seven dreary Kaffir wars, during which an interesting offshoot of the 60th Rifles eventually grew into the Cape Mounted Riflemen, a body of military constabulary consisting at first of Hottentots and later of Europeans. This force maintained a fine tradition until four years ago, when its lineal descendant, the 1st South African Mounted Riflemen, was transferred to the South African Police. Gradually, in the town and English-speaking areas, volunteer units were formed and organized on the Regular Army model. They all established fine records, and were eventually absorbed in the Union Defence Forces, in which most of them now perpetuate their past history.

In the end, after these various military traditions had contributed in the several parts of South Africa towards the establishment of civilized government, there came the conflict of 1899–1902. Eight years later the Union of South Africa was founded, while in 1912 the Defence Act was passed which is the basis of the modern military organization of South Africa.

III.—The Defence Act.

The South Africa Defence Act, 1912 (amended in 1922), was sponsored by General Smuts, the first Union Minister of Defence. It rests on a compulsory basis and is modelled on the Swiss principle. Section I of the Act reads:—

> "Subject to the provisions of this Act, every citizen shall be liable between his seventeenth and his sixtieth year (both included) to render in time of war personal service in defence of the Union in any part of South Africa, whether within or outside the Union."

Under this Act the Union Defence Forces comprise the following:—

(1) The South African Permanent Force.

(2) The Citizen Force.

Each of them will be dealt with in detail later.

These forces are mainly composed as follows:—

(*a*) The South African Permanent Force, comprising H.Q. Staff and a few artillery and air force units, with some small technical detachments. These are all maintained on a regular basis and total about 1,000 of all ranks.

(*b*) The Citizen Forces, consisting mainly of:—

(i) An Active Citizen Force, organized as a mobile force, composed of three Infantry and one Mounted Brigade. It is maintained on a basis resembling that of the British Territorial Army.

(ii) A large number of Commandos formed out of local Defence Rifle Associations on a basis which permits of their employment as mobile units. But they lack any grouping into higher formations. The Commandos number altogether between 130,000 and 140,000 of all ranks.

Behind these there exists a National Reserve and a virile system of cadet units.

The military traditions of Boer and British are thus incorporated in the Citizen Forces, in so far that the volunteer units were transferred into the Active Citizen Force, while the old commando system reappears in the Defence Rifle Association. The obligations of citizens are limited under the Act to Europeans, who are required to register themselves on attaining the age of seventeen years. They may then volunteer to serve before attaining the age of twenty-one years. Service in the Active Citizen Force is for a period of four years. If the annual contingent required to maintain units at authorised strength is not forthcoming, the Act makes provision for a ballot to be held. It is a matter of pride in South Africa that it has never been necessary to resort to the ballot. Members of mounted units of the Citizen Forces are entitled to register their horses, which are then insured for them at the public expense; in time of war the horses are taken over by the State at a valuation. Each citizen posted to a mounted unit is " obliged to bring with him a serviceable riding horse, saddle and bridle " when called out for training, during which period he is paid a horse allowance. Employers are enjoined to give all proper facilities for enabling any citizen in their employ to carry out his training: heavy penalties can be imposed for various kinds of obstruction and interference which certain types of employers are likely to adopt.

Provision is made for the co-operation of Imperial and Union forces for the joint defence of South African ports, and for the placing of any portion of the latter under the command of the Imperial general officer commanding.

Citizens entered for training in the Royal Naval Volunteer Reserve, or those entered for *whole* time service in the South African Naval Service, may be placed at the disposal of the Royal Navy for general service.

The Army Act, modified in accordance with South African laws and customs, is applied to the military forces in the form of the Union Military Discipline Code, whilst the Naval Service is disciplined in terms of the enactments in force in the Royal Navy.

Further legal provisions include the establishment of a Council of Defence to advise the Minister, but with no executive authority; the

training in urban or populous areas of all boys between the ages of thirteen and seventeen as cadets, unless their parents or guardians lodge written objections; facilities for commandeering buildings, foodstuffs, horses, vehicles, etc., in time of war against compensation; permissible penalties and the official application of the Official Secrets Act (United Kingdom) in time of war. On an outbreak of war the Governor-General may also establish a censorship over all postal and telegraphic matter passing through the Union.

All officers and N.C.Os. are instructed in giving and receiving executive words of command in each of the official languages of the Union, and all citizens are trained in the official language best understood by them.

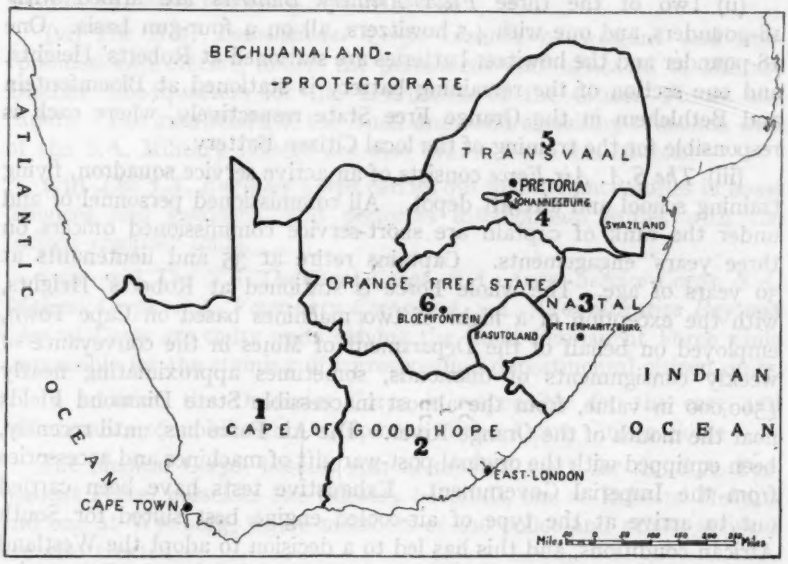
The following are exempt from service in time of war:—medical unfits, officers of Parliament and judicial officers, judges, ministers of religion, prisoners, warders and members of the Police Reserve, lighthouse personnel, employees in public hospitals and conscientious objectors; but the latter may be called upon to serve in a non-combatant capacity.

IV.—Organization.

The Governor-General, as the representative of H.M. the King, is Commander-in-Chief. All executive authority is vested in the Minister of Defence, and he is responsible to Parliament for national defence, and is advised by the Defence Council, consisting of non-serving members, and by a Military Board consisting of the Heads of Military Sections at Defence Headquarters. The Chief of the General Staff, a major-general, is also the General Officer Commanding the Union Defence Forces. He exercises various other functions; in fact his position is virtually that of a Chief of Staff after the Continental model, while he is also the accounting officer of the department, and as such is responsible to the Minister for all expenditure. Consequently he is faced by the financial consequences of the military policy which he recommends to the Government. Besides an Adjutant-General, a colonel with temporary rank of brigadier-general, and a Quartermaster-General, there are as heads of sections a Director of Air Services, and a Director of Medical Services: the three latter are all colonels; the third is also the Officer Commanding the South African Air Force, while the D.M.S. is responsible to the Chief of the General Staff and not to the Adjutant-General.

The Officer Commanding the Naval Service is not a head of a section as this small Service does not yet justify that status; but when naval matters are considered by the Military Board he is summoned to attend. There are six Military Districts, three commanded by colonels and three by lieutenant-colonels. These exercise command over all units in their Districts, except that in the Pretoria District the permanent

cantonments at Roberts' Heights are not under the Officer Commanding the District, but under the command of an Officer Commanding Troops. These districts are shown on the accompanying map.



V.—The South African Permanent Force.

Enlistment in the Force is for a period of three years, and re-engagement is permitted by periods of two years up to a maximum age limit. In the case of privates, for example, this is 45 years.

The Permanent Force consists entirely of specialist services, both officer personnel and other ranks, and of small nuclei of departmental services as follows:—

(i) A Staff Corps, for command and H.Q. services;
(ii) 3 Batteries of S.A. Field Artillery;
(iii) The S.A. Air Force.
(iv) S.A.P. Garrison Artillery;
(v) S.A. Naval Service;
(vi) S.A. Instructional Corps;
(vii) S.A. Engineer Corps;
(viii) S.A. Ordnance Corps;
(ix) S.A. Army Service Corps;
(x) S.A. Medical Corps;
(xi) S.A. Veterinary Corps;
(xii) S.A. Administrative, Pay and Clerical Corps.

(i) *The Staff Corps* is a corps of approximately forty officers who direct the organization from Defence Headquarters, and supervise training in the Military Districts, and supply the lectures at the Military College.

(ii) Two of the three *Field Artillery Batteries* are armed with 18-pounders, and one with 4.5 howitzers, all on a four-gun basis. One 18-pounder and the howitzer batteries are stationed at Roberts' Heights, and one section of the remaining battery is stationed at Bloemfontein and Bethlehem in the Orange Free State respectively, where each is responsible for the training of the local Citizen Battery.

(iii) *The S.A. Air Force* consists of an active service squadron, flying training school and aircraft depot. All commissioned personnel of and under the rank of captain are short-service commissioned officers on three years' engagements. Captains retire at 35 and lieutenants at 30 years of age. The whole Force is stationed at Roberts' Heights, with the exception of a flight of two machines based on Cape Town, employed on behalf of the Department of Mines in the conveyance of weekly consignments of diamonds, sometimes approximating nearly £500,000 in value, from the almost inaccessible State Diamond Fields near the mouth of the Orange River. The Air Force has, until recently, been equipped with the original post-war gift of machines and accessories from the Imperial Government. Exhaustive tests have been carried out to arrive at the type of air-cooled engine best suited for South African conditions, and this has led to a decision to adopt the Westland Wapiti as the standard service aircraft. This will bring the S.A. equipment into line with that of the Royal Air Force and Royal Australian Flying Corps.

(iv) The seaward defences of Cape Town and Simonstown, the S.A. Naval Base, are manned by the *S.A. Garrison Artillery* and *S.A. Engineer Corps*, augmented in time of war by the (Citizen) Cape Garrison Artillery and Cape Fortress Engineers, to which the former normally act as instructors.

(v) *The Naval Service* is a Division of the Royal Naval Volunteer Reserve and consists of five general service sub-divisions and four mine-sweeping flotillas. It is entered for whole-time training and possesses two mine-sweeping trawlers and a hydrographic survey sloop. It is commanded by an officer—at present of the rank of commander—on loan from the Royal Navy. The function of the minesweepers is to train the minesweeping flotillas at the coastal towns. In time of war these volunteers man auxiliary minesweeping craft earmarked from amongst trawlers and other craft engaged on coastwise operations, and are to be responsible for maintaining clear approaches to South African harbours selected as convoy assembly or refuge ports for Empire shipping. The remaining personnel would be placed at the disposal of the Admiral

Commanding Africa Station, Simonstown, to furnish gun crews for armed merchantmen, etc. The hydrographic survey vessel is engaged in charting the South African coast, many of the charts being based on old surveys and, therefore, inaccurate.

(vi) *The S.A. Instructional Corps* consists of warrant and non-commissioned officers, and is the permanent staff allocated to Military District Headquarters for the instruction of the Citizen Forces and cadets. The instructors at the small arms and signalling branches, etc., of the S.A. Military College are also drawn from this source.

(vii) *The S.A. Engineer Corps* carries out maintenance duties in coast defences and garrisons, and performs instructional duties with the Citizen engineer units.

(viii—xii) The *S.A. Ordnance Corps*, *S.A. Army Service Corps*, *S.A. Medical Corps*, *S.A. Veterinary Corps* and *S.A. Administrative Pay and Clerical Corps* are cadre units serving the small Permanent Force while responsible for the training of corresponding departmental citizen units.

In addition the Ordnance Corps is responsible for the care and maintenance of mobilization equipment of the Active Citizen Force.

The Medical Corps, besides normal medical work for the S.A. Permanent Force, possesses two military hospitals, one at Roberts' Heights and one at Wynburg, where members of the police and prison services are also treated.

In addition the Permanent Force has charge of the *S.A. Military College*, Roberts' Heights, comprising three branches:—

(1) The General Branch, where the following courses are conducted:—Staff Duties for Permanent Force officers, 12 weeks; S.A. Permanent Force Cadets, 18 months for training Cadets qualifying for commissioned appointments in the S.A. Permanent Force. Separate courses for officers qualifying for promotion in the Permanent Force, Active Citizen Force, Defence Rifle Associations, and Cadets; also courses in Gunnery, Administration and Cookery.

(2) The Small Arms Branch, where Vickers, machine and Lewis gun, and Musketry Instructors' courses are conducted.

(3) The Signalling Branch, where courses for Regimental Signallers and Signalling Instructors in the Permanent Force and Active Citizen Force are conducted.

VI.—The Citizen Forces.

These combine:—

(1) *The Coast Garrison Force*, raised with a view to supplementing the permanent S.A. Garrison Artillery in coast defences. Trained men

carry out ten days' non-continuous training and fourteen days' continuous training in conjunction with the S.A. Permanent Garrison Artillery.

(2) *The Active Citizen Force.*—This is organized into three Infantry Brigades and one strong mounted Brigade, comprising the following units :—

5 Citizen Batteries (18-pdr.—4 gun) ;
3 Companies Garrison Artillery ;
11 Infantry Battalions ;
5 Mounted Regiments ;
1 Company Fortress Engineers ;
3 Field Companies, Engineers ;
1 Field Troop, Engineers ;
2 Armoured Trains ;
1 Machine Gun Squadron ;
2 Companies, Medical Corps ;
3 Field Ambulances ;
1 Hygiene Company ;
2 Veterinary Sections or Hospitals ;
4 Supply Sections.

These units are widely distributed throughout the Union. After doing their cadets and recruits training, the men only carry out the following non-continuous training each year : mounted regiments, three days ; field batteries and infantry battalions, six days ; and all do ten days' continuous training in Camp. All members of the Coast Garrison Force and Active Citizen Force serve for four years and are then posted to the Reserve, unless retained for longer as non-commissioned officers or specialists. All units are armed, equipped and trained on lines practically analogous to the British Territorial Army, but they do not obtain any assistance from regulars, except the services of a non-commissioned or warrant officer instructor of the S.A. Instructional Corps.

There is also an Air Force Section, which comprises the following :— one squadron in the Transvaal consisting of cadets from the Pretoria University, who, on qualifying as pilots, pass to the Special Reserve ; aircraftsmen and mechanics, all of whom come up for training at Roberts' Heights ; also a Special Reserve of Pilot Officers who annually undergo three weeks' training, and who are retained up to a maximum age of 40 years, and are then posted to General Reserve up to the age of 50.

(3) The *Commandos* are formed by members of *Defence Rifle Associations*, who are mainly voluntarily recruited between the ages of 17 and 60 years. There are 148 Commandos, comprising 4,444 Rifle Associations.

The strengths of Commandos (i.e., Defence Rifle Associations organized by magisterial districts) vary, but they must possess a minimum of 600 members. A Commando consists of three or five squadrons, each of four troops. The officer commanding is styled Commandant, and may be a lieutenant-colonel or a major, according to length of service and qualifications. In the rural districts where there are no Active Citizen Force units, citizens of the age of 21 are liable to be posted to Special Training Squadrons, which are organized in forty of the Commando areas. Each of these has a strength of approximately 100; service in them is also for four years. Every member of these squadrons must attend four annual training camps of twelve days duration each. Members of Special Training Squadrons are armed, uniformed and equipped at government expense as members of the Active Citizen Force, but must supply their own horses and saddlery. Members of Defence Rifle Associations must provide their own horses, saddles, bridles, rifles and equipment, only officers receiving an allowance for uniform. All members of Defence Rifle Associations receive a free issue of 50 rounds S.A.A., and can buy ammunition and rifles at reduced price. Defence Rifle Associations receive capitation grants in respect of members who have attended a prescribed number of musketry practices, and a partial free issue of rifles on bond up to 10 per cent. of their strength. The policy is that the Special Training Squadrons should work as a leaven amongst the Defence Rifle Associations, gradually improving their discipline and efficiency until they attain the Active Citizen Force standard.

There are 3,285 officers and 135,157 members in the Defence Rifle Associations.

(4) *The National Reserve* represents the remainder of the manhood of the nation up to 60 years of age, who are not enrolled in any of the foregoing but liable to be called up in a case of national emergency.

(5) *Cadets.*—The Cadets, although not belonging to the Union Defence Forces, play a very important part in the defence organization of South Africa. There are 493 detachments throughout the Union. All boys between the ages of 13 and 17 inclusive can be called upon to undergo training, in so far as local conditions such as distance, etc., permit. The compulsory training subjects are drill, miniature rifle shooting and physical training. In the larger schools additional subjects, e.g., signalling, stretcher-bearer work, etc., are taught. Detachments are officered mostly by masters, who hold commissions on the Supernumerary List, Active Citizen Force, and also be selected student officers. Courses of three weeks duration are held for officers at the S.A. Military College. Camps and bivouacs are held from time to time. There are

approximately 1,400 Officers and 52,100 Cadets. South Africa last year won the King's (Cadet) Trophy for shooting for the fourth time.

VII.—The Defence Policy.

The defence organization exists for two purposes (*a*) to maintain law and order within the Union, and (*b*) to protect the Union against foreign aggression. In the first case the position is best appreciated when it is stated that South Africa (i.e., the Union and High Commission Territories) contains approximately seven million natives as against about one-and-three-quarter million Europeans, the greater part of the former just emerging from barbarism. In addition, there is present a considerable white population attracted by the lure of gold and minerals, and this from time to time may become impatient of control and sometimes can even defy authority.

The aim of South African defence policy is for the Union to arm, train and organize its forces in principle as for Imperial Defence, so that in case of a world-wide emergency the Union could participate in an Imperial force. For purposes of purely local defence, modifications in training and organization have been introduced to suit local conditions; but the principle of standardization of equipment is maintained. For the same reason South African officers are sent periodically to the Imperial Defence College, the Army and Air Force Staff Colleges, and other military training centres in the United Kingdom. Furthermore, a system of interchange of Imperial and Union officers has been evolved. For the present no organization higher than that of the brigade has been called into being. Besides the existing formations of the Active Citizen Force, provision exists for the organization of two or more brigades into a mobile force for purely local operations, should occasion arise.

VIII.—Military Resources.

There are no arsenals or equipment factories in South Africa; all material must be imported. From a military point of view, the defence of the country against foreign aggression would be seriously hampered by the absence of petroleum, while all supplies have to be imported. Horse-breeding is seriously on the decline, a circumstance causing grave concern to the authorities. The country is gradually passing from a largely pastoral to an industrialized state, as its vast resources of coal and iron are being worked. If ever the potential steel and iron industries are fully established, and adequate markets have been found for its products, the European population will undoubtedly increase greatly, and of course a larger industrial urban population will stimulate the growth of agricultural population. The present economic, social and defence problems will then alter considerably.

AIR EXERCISES 1930

By Flight Lieutenant W. M. Yool, *p.s.a.*, R.A.F.

THE object of the exercises which took place during August, as officially announced before their commencement, was :—

(*a*) To give staffs and bomber squadrons experience in directing and carrying out long-distance bombing raids under conditions permitting considerable latitude of action ;

(*b*) To give staffs and single-seater fighter squadrons experience in conducting a strategic defensive under conditions likely to exist in an overseas campaign.

For the purpose of the exercises England was divided into two parts, the Northernmost of which was called Red Colony and the Southernmost Blue Colony, separated by a frontier which ran from Flint, through Shrewsbury, Worcester, Newbury and Horsham to Chatham.

These two colonies represented overseas possessions of Redland and Blueland, two first-class Powers who possessed strong naval, military and air forces.

Red Colony was assumed to be a sparsely-populated country with poor communications, and with the majority of the population collected in a few main centres. The value of the colony to Redland lay in the valuable mineral deposits which existed near Hucknall and Bircham Newton, and it was of vital importance to ensure a continuance of the supply of ore from these centres. Catterick, supposed to be connected to the sea by a canal, was the principal port for the storage and export of the minerals, and was connected by rail to the centres of the mineral industry. Two other small ports existed at Skipsea and Donna Nook, which were used for the disembarkation of troops and stores.

Blue Colony was assumed to be a mountainous country with poor communications, and with a population which was mainly agricultural, the only centres of any importance being Old Sarum, the capital, and Gosport, a small naval base. There were no railways.

The frontier between the two colonies was supposed to be very mountainous, and there were four mountainous masses in particular over which flying was assumed to be impossible. Aircraft flying from one colony to the other were, therefore, compelled to approach through one of the various passes.

By courtesy of "The Times."

Both colonies possessed small but efficient air forces, and their naval and military forces were so small as to be of use for local defence only. The air forces allotted to each side were as follows :—

(*a*) *Blue Colony.*

3 Night bomber squadrons.
6 Day bomber squadrons.
3 Fighter squadrons.

—

Total 12 Squadrons of 138 aircraft.

(*b*) *Red Colony.*

2 Night bomber squadrons.
3 Day bomber squadrons.
8 Fighter squadrons.

—

Total 13 Squadrons of 152 aircraft.

Prior to the commencement of the exercises, war was imminent between Redland and Blueland, and Blueland had sent an ultimatum to Redland which expired at 11 a.m. on the 12th August, 1930. The principal theatre of war was supposed to be the home frontiers of the two countries, where the main forces of each were heavily engaged, and during the first few days of the war, owing to the weakness of the naval and military forces in the two colonies, hostilities between Red and Blue Colony would necessarily be confined to action between the opposing air forces.

Prior to the commencement of hostilities, the A.O.C., Blue Colony, was informed that the Blueland Government attached the greatest importance to denying to Redland the mineral resources of Red Colony, and that the aim of the air force was to ensure this.

The Redland Government informed the A.O.C., Red Colony, that the Blueland Government attached great importance to denying to Redland the mineral resources of Red Colony, and that as air attacks with this object in view were to be expected, the aim of the Red air force was to protect the mineral resources.

In order to effect his aim, the A.O.C., Blue Colony, decided to carry out a continuous attack by his day and night bombers on the mineral centres at Hucknall and Bircham Newton, and on the capital at Cranwell. Catterick was within range of his night bombers only, and attacks on the port and canal there were also to be carried out by these aircraft.

His fighter squadrons were to be employed mainly on defensive patrols with the object of protecting the Western group of aerodromes and the capital, Old Sarum.

In carrying out his plan, two day bomber squadrons were detailed to attack Bircham Newton, four day bomber squadrons were detailed to attack Cranwell and Hucknall, and the main effort of the three night bomber squadrons was to be directed against the docks, ships, and canal gates at Catterick, whilst the remainder of the night bombers were also to attack Hucknall and Bircham Newton, and to make occasional diversions against Cranwell.

The three fighter squadrons were to be located at Upavon, and one squadron was to be continuously on patrol over Andover and Worthy Down, where it would be conveniently placed to intercept attacks on any of the Western group of aerodromes.

The A.O.C., Red Colony, decided that his only course of action in order to attain the aim which had been laid down for him by the Government, the protection of the mineral resources, was to defeat or immobilize the Blue air force. In order to achieve this he decided to

employ ten of his squadrons, that is, five S.S.F.[1] squadrons, three day bomber squadrons, and two night bomber squadrons, on a vigorous offensive against the Blueland air force, both in the air and on the ground, and to utilise his remaining three fighter squadrons for the defence of Cranwell and Bircham Newton. To assist in the defence of Cranwell he also had available a searchlight battalion, with a peace time establishment of twenty-four lights, which covered an area 14 miles by 7 to the South of Cranwell, and six portable W/T pack sets, which were organized as a line of listening posts to the south of the searchlight area.

To carry out his plan of action he organized his offensive squadrons into three wings. One wing with headquarters at Hornchurch, consisting of two fighter squadrons and one day bombing squadron, was detailed to take offensive action against the Eastern group of Blue aerodromes. The second wing with headquarters at Kenley, consisting of three fighter squadrons and two day bomber squadrons, was detailed to take offensive action against the Western group of Blue aerodromes. The third wing with headquarters at Cranwell, consisting of the two night bombing squadrons, was detailed to carry out night attacks as required on Blue aerodromes, and for this purpose the squadrons were to move forward each evening to one or other of the advanced aerodromes, returning to their base at dawn.

Previous to the opening of hostilities, the opposing commanders were free to move their squadrons to any of the aerodromes which had been allotted for the exercises, and the majority of the squadrons were so moved and, therefore, operated from aerodromes other than those they normally occupy. The moves of each side were unknown to the opposing commanders, and therefore, when the exercises commenced, neither side knew where the squadrons of the opposing air force were located.

The actual position of the two forces was as follows:—

(*a*) *Blueland.*

1 Night bomber squadron at Andover.
2 „ „ „ „ Worthy Down.
2 Day „ „ „ Andover.
2 „ „ „ „ Tangmere.
1 „ „ „ „ Lympne.
1 „ „ „ „ Manston.
3 Fighter squadrons „ Upavon.
Aircraft Depot (imaginary) at Tangmere.

[1] S.S.F—Single-seater fighter.

(*b*) *Redland.*

2 Fighter squadrons at Hornchurch.
1 Day bomber squadron at Duxford.
2 Fighter squadrons ,, Kenley.
1 ,, ,, ,, Northolt.
1 Day bomber ,, ,, Upper Heyford.
1 ,, ,, ,, ,, Bicester.
1 Night ,, ,, ,, North Coates.
1 ,, ,, ,, ,, Waddington.
2 Fighter squadrons ,, Cranwell.
1 ,, ,, ,, Bircham Newton.
Aircraft Depot (imaginary) at Catfoss.

Blue commenced the operations by sending twelve of his night bombing aircraft to bomb the docks, ships and canal gates at Catterick. These aircraft left immediately after the outbreak of hostilities at 11 a.m. on 12th August, and flying via the Sealand Pass, eight of the aircraft were successful in reaching their objective and returning to their base without being intercepted. Of the remaining four, one was forced to land, and three were compelled to return owing to the weather conditions. It is difficult to assess accurately the damage which this attack could have caused, but it might well have been sufficient to attain Blue's aim, the denying to Redland of the mineral resources of Blue Colony, without further action, as if Catterick was put completely out of operation, no other port was available from which the ore could readily be exported.

A further successful attack by night bomber aircraft operating by day was made on Cranwell on the afternoon of Thursday, 14th August, although on this occasion Blue's aircraft did not escape unscathed, as they were intercepted near the end of their return journey by some Red fighters, which had been attacking some Blue aerodromes, with the result that two of the night bombers were adjudged to have been shot down.

For the remainder of the operations, Blue's bombing aircraft were employed mainly on a series of attacks delivered at frequent intervals on the mineral centres at Bircham Newton and Hucknall, and on the capital and railway junction at Cranwell. Attacks were also made on the ports at Skipsea and Donna Nook. Only towards the close of the operations, by which time Red's attacks on the Blue aerodromes had achieved a considerable measure of success, did Blue use his aircraft for the attack of the Red aerodromes.

During the greater part of the operations, Blue used his fighters, based on Upavon, to maintain a continuous patrol by day of one squadron at a time between Andover and Worthy Down for the defence

of his Western group of aerodromes and his aircraft depot at Tangmere. As with his bombing squadrons, however, the fighter squadrons were also used towards the close of the operations for the attack of Red aerodromes.

Redland commenced his operations by making reconnaissance flights over Blue's aerodromes with the object of locating his squadrons, and similar flights were continued thoughout the operations. By means of these flights, reports from other aircraft and deciphered wireless messages, the positions of Blue's squadrons were located fairly accurately by the afternoon of the second day of the operations.

Simultaneously with the despatch of these reconnaissance aircraft, bombing attacks by his day bombing squadrons, and low-flying attacks by Redland S.S.F. squadrons were made on those Blue aerodromes which were considered most likely to be occupied, and on the depot at Tangmere. These attacks, and night attacks by his night bombing aircraft, were continued almost without intermission throughout the operations, and would undoubtedly have damaged or destroyed a considerable number of Blue aircraft, and materially reduced his power to continue his offensive. Flights by fighter squadrons were also made over Blue aerodromes, whilst bombing attacks were in progress, with the object of protecting the bombers from Blue fighter aircraft.

The umpires' reports assessed that a total of approximately 150 Blue aircraft were destroyed during the operations, and when it is considered that at the start of the operations the first line strength of Blue was only 138 aircraft, and that he would be unlikely to have had more than at the outside double this number in reserve, the measure of the disorganization which would have been achieved by Red can be estimated.

It will take some considerable time before the actual results of the operations, which concluded at 3 a.m. on 15th August, can be fully assessed, but there is no doubt that the object of the exercises, as set out at the beginning of this article, was satisfactorily achieved.

Whether the war would have been won by Blue Colony or Red Colony is a question which it is difficult to answer, but the writer is of opinion that the successfully executed surprise attack on Catterick by Blue's night bombers would in itself have gone a long way towards accomplishing Blue's aim, and that even with the depleted, and probably partially disorganized force which would have been left to him as a result of Red's attacks on his aerodromes, he would still have been able to continue his offensive against the mineral centres of Red Colony, and thus still further interrupt the mineral supplies which were so necessary to Redland for the successful prosecution of the war.

One of the most interesting features of the operations was the method adopted by the A.O.C., Red Colony, to endeavour to ensure interception of Blue's bombing attacks by the three fighter squadrons stationed at Cranwell and Bircham Newton. The searchlight battalion and the few mobile pack W/T sets allotted to Red were only sufficient to protect a small sector to the south of Cranwell, and even here covered such a small area that they were only able to give sufficient warning to enable the slower night bombing aircraft to be intercepted. The fast day bomber squadrons were usually able to get clear away, unless Red fighter aircraft happened to be actually in the air.

Realizing that unless he could get adequate warning of the approach of enemy attacks it was almost impossible to intercept them, Red stationed single day bomber aircraft over the Blue aerodromes and in the passes through which the Blue aircraft were most likely to approach. The duty of these aircraft was to shadow Blue's bombing formations, if possible without being seen, and to transmit by wireless to Red Headquarters messages giving the course, height, speed and number of the enemy aircraft. This method proved highly successful, and enabled a considerable number of Blue's bombing attacks to be intercepted which, in all probability, would not otherwise have been done.

Red also stationed a single fighter aircraft about forty miles South West of Cranwell during the hours of daylight for the purpose of giving early warning of the approach of enemy raids, but this particular patrol achieved little, possibly because the weather conditions were of considerable assistance to the attacking aircraft, as they were usually able to take advantage of clouds to approach their objective unseen.

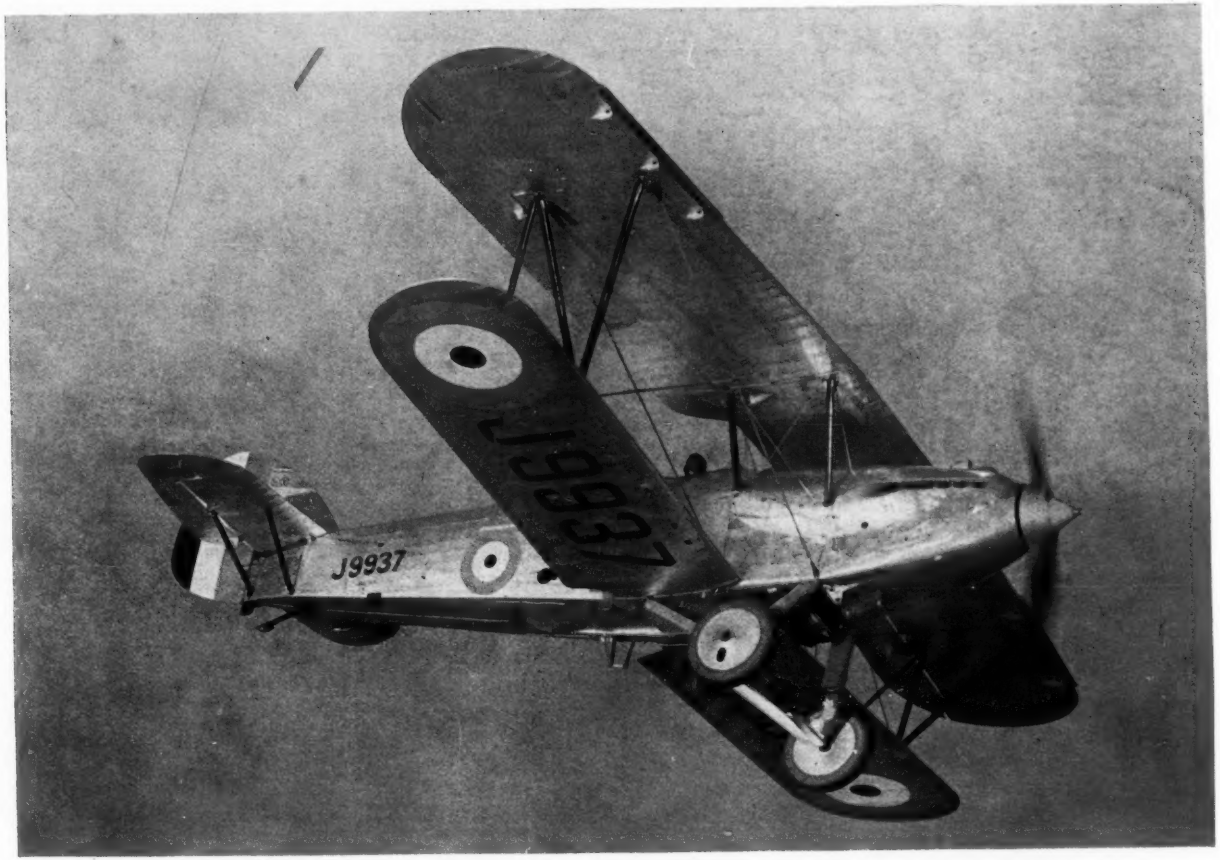
This goes to prove still further the importance, already so highly stressed in the Home Defence problem, of obtaining early information of the approach of enemy aircraft if there is to be any prospect of the defending aircraft preventing them from reaching their objective. There appear to be only two ways of doing this, either by reconnaissance aircraft permanently patrolling by day in the vicinity of the enemy aerodromes or over the most likely lines of approach, ready to shadow any formations which take off, or by the provision of advanced observation posts on the ground provided with pack W/T sets. The latter method appears to be the more certain, and the more economical, as patrolling aircraft may miss a formation, and are a comparatively easy prey for the enemy's fighter aircraft; moreover and this is most important if the enemy has many bases from which he can operate and many possible lines of approach, this method would require so many aircraft that it must lead to a considerable reduction in the striking force at the disposal of the defender.

It therefore appears worthy of consideration whether a unit equipped with a number of pack W/T sets and the necessary operators should not be added to any searchlight units allotted to an Expeditionary Force. The function of this suggested unit would be to provide observation posts at a sufficient distance in front of any localities which it was specially desired to protect from air attack, to enable adequate warning of the approach of enemy aircraft to be given to the defending aircraft. Intermediate posts would also have to be provided in sufficient numbers to ensure that the course of the attacking aircraft could be plotted with sufficient accuracy to ascertain which objective he was probably making for, and an outer ring of observation posts alone would, therefore, not be sufficient. These mobile W/T observation posts, in countries overseas where our Army and Air Force may be called upon to operate, would take the place of and fulfil the same purpose as the fixed observation posts in the Home Defence Scheme, which are linked to the various headquarters by telephone.

It is realized that such a system could only be operated successfully where the localities to be defended are far enough from the frontier for the listening posts to be sufficiently far advanced to enable adequate warning to be given of the approach of enemy aircraft.

Finally, the exercises gave further proof, if further proof is required, of the limitations of aircraft as a defensive weapon if used defensively, and how impossible it is by defensive measures alone to prevent aircraft reaching their objectives. Undoubtedly Red pursued the best course open to him in the conditions of the exercise, that of a vigorous offensive against the Blue air force, but, successful though his offensive was, he was unable to make it effective early enough to prevent the Blue air force doing irreparable damage.

Blue's policy of commencing the operations by practically ignoring the existence of the enemy air force, and concentrating on the attack of those objectives, the destruction of which would best achieve his aim, was fully justified by results; and, although towards the end of the operations he was forced to divert a portion of his air force to the attack of the Red air force, he was still able to allocate sufficient aircraft for continuing the attacks on Bircham Newton and Hucknall to ensure that Red would still be unable to make use of his mineral resources.



THE "HAWKER HART"

A NEW TYPE OF DAY BOMBER

Photograph by courtesy of "The Scotsman."

"HINDENBURG"

Sport and General Press Agency.

"MOLTKE" ENTERING ROSYTH DOCK

SALVAGE OPERATIONS AT SCAPA FLOW

SALVAGE OPERATIONS AT SCAPA FLOW

With the recent safe delivery of the 28,000 *ton battle-cruiser "Hindenburg" to the basin at Rosyth Dockyard, where she is being broken up, the firm of Messrs. Cox and Danks, Ltd., has now salved no less than thirty of the sunken vessels belonging to the interned High Sea Fleet. This will certainly come to be regarded as one of the world's greatest salvage feats. We are indebted for the account which follows to the Editor of "The Engineer" the pages of which journal should be referred to for fuller and more technical details.*—EDITOR.

IT was on the 21st of June, 1919, that the German fleet in Scapa Flow was scuttled. Only one of the large German ships, the "Baden," remained in a floating condition, and she was later taken to Portsmouth Dockyard, where a detailed examination of her structure and machinery was made prior to dismantling her.

On account of international and other reasons, nothing official was done with regard to the salvaging of the scuttled fleet until the Spring of 1924, when Mr. E. F. Cox, a steel manufacturer and merchant, engaged in dismantling naval vessels at Queenborough, applied himself with much enthusiasm and originality to the task. Meanwhile, some of the more practically minded natives, a little resentful perhaps of the blocking of their Sounds and waterways by the sunken vessels, had commenced to remove some of the lighter non-ferrous articles and fittings from the ships, which they tactfully exported, packed in herring barrels. The above water coal bunkers of the "Seydlitz" also served to replenish local fuel stores, until such a time as a small charge was made by the Admiralty for coal thus unofficially salved from the ships.

The Scapa Flow salvage scheme may be said to have been initiated with the acquisition by Messrs. Cox and Danks of a large German floating dry dock, specially designed for submarine repair and testing work. This had an overall length of 400 ft. with a total width of 130 ft., and in the centre there was a 40 ft. diameter cylindrical chamber in which the submarines were placed. The pumps and workshop accommodation associated with the usual dry dock were provided for in the walls of the

structure. The cylindrical body had already been cut away in the process of demolition, when Mr. Cox saw the great possibilities of a structure of this kind, and its adaptability to salvage needs.

Having arranged with the Admiralty authorities to undertake the salving of some light destroyers, Mr. Cox then set about the work of modifying his dry dock for this particular use. A line of 6-inch diameter shafting, carrying twenty steel pulley wheels each with a grooved face, was erected in strong housings along the edges of the pontoon, and on the deck surface of the pontoon there was arranged a line of twenty triple-geared hand winches with sheaves and the necessary wire ropes. The deck of the pontoon was further served by two 7½ ton cranes with 90 ft. jibs, and the accommodation in the walls was utilized for engineers, joiners, and blacksmiths workshops, generating plant for electricity and compressed air, a well-equipped machine shop, an electrical workshop, and storerooms. When thus fitted out, the whole dock was towed in one piece to Scapa Flow, and on its arrival was then cut into two parts, making two 200 ft. lifting docks, each with ten winches and one crane, along with the other facilities.

Destroyers.

The first vessel to be tackled was the 700-ton destroyer "V.70," which was lying in about ten fathoms of water. The two docks were brought into position over the wreck, and, by means of divers, ten 3½-inch wrought iron cables were passed beneath the hull of the sunken vessel and secured to the winches, the cables passing over the pulleys at the edges of the pontoon. The quick fixing of the ten slings beneath the hull was facilitated by first tilting it by means of ropes passed below the propeller shafts or underneath the stern. The first attempt failed to lift the ship owing to the breaking of chain links in the slings, but with the replacing of the chain cables by 9-inch circular steel ropes, success was at once achieved.

Early in the morning of 1st August, 1924, the first destroyer was slowly raised from the bottom by men carefully operating the winch gears. When well clear of the bottom, the two docks with their load were slowly towed into Mill Bay, a sandy inlet on the Island of Hoy, not far distant from the firm's Lyness Pier Depot. In the evening, the destroyer was grounded and was lifted higher up the beach on the next tide till she was in a safe position. The same programme was followed in the lifting of the next destroyer, "S.53," and within eleven days she was also beached in Mill Bay. By mid-October, no less than seven ships had been successfully raised and beached, in well under a fortnight each.

With the setting in of the winter weather in the Flow, salvage work had to be temporarily abandoned, and the next few months were utilized in breaking up the vessels raised and preparing different batches of metal for dispatch to the melting furnaces. The first ship to be raised, " V.70," had a more interesting fate, for after her machinery had been removed she was re-equipped as a floating salvage unit, with a rail track on her deck, on which a travelling steam crane was placed, also pumps for dealing with the water in her sister ships already salved and partly beached. Early in March, 1925, the salving of destroyers was renewed, and with the experience already gained it was found possible to deal expeditiously with vessels on their sides or deeply embedded in sand, or fouled with other ships. Destroyers were lifted upside down, were righted and then relifted, and when direct lifting failed compressed air was used as an auxiliary agent. The methods which had proved so successful in the raising of the 750 to 800-ton destroyers were later used with equal success for the 1,500-ton ships. On 30th April, 1926, the last of the large destroyers, " G.104," was brought to the surface, and was towed into Mill Bay on the 1st day of May.

Battle Cruisers and Battleships.

Attention was next directed to one of the largest of the battle cruisers, the " Hindenburg," which had settled down on her keel in an upright position in about ten fathoms of water. Her two broad funnels and her tripod mast stood clear of the water, and were a familiar sight to passengers in the s.s. " Ola," plying between Scrabster on the mainland and Stromness at the far end of the Flow.

In addition to the two docks, which had been so successfully employed in lifting the destroyers, two other sections of the old German dry-docks acquired by the firm for purposes of dismantling were turned to effective use. These four docks were moored, two on either side of the ship, and two additional cranes were brought into operation, with batteries of small oil engine-driven compressors and pumping sets, and steam-driven generators and pumps. Many of the pumps were submersible units driven by alternating current motors, power for which was supplied from special steam and oil engine-driven alternators. The *modus operandi* was to seal up all openings in the ship by applying wooden patches, reinforced with steel if necessary. The inside and outside of the ship was surveyed by some fourteen divers, who fixed the patches and worked to get the compressed air well down into the lower compartments of the ship. Small openings were sealed by cement or wooden plugs, and some seven hundred special patches had to be made. The largest patch—750 sq. ft.—covered a funnel uptake, which, owing

to extensive corrosion and thinning of plates and stays, had to be cut away.

For some time very serious trouble was encountered owing to the shoals of small fish eating the oakum and tallow packings which were most often used. A very simple expedient, namely that of mixing a little cement in the tallow, proved effective against the marauding hosts, and the work of making the hull both air and water tight went forward for close upon five months.

In mid-August, 1926, a definite attempt was made to lift the ship, and she was raised by the bow and the stern in turn. Unfortunately, when nearly clear of the bottom, she gradually acquired a heavy list to port, and the salvage staff were frequently in an awkward and dangerous situation. As time went on, further progress was only very slow, and with the failure of one of the water tube boilers supplying steam to the alternator sets, and the prospect of prohibitive prices for fuel on account of the coal strike, a check was put on further work. With much regret, Mr. Cox decided to let go the wreck, and to start work again in the Spring, when the weather conditions were more favourable. After operations had been abandoned, the ship took two days to resume her submerged condition, in which she remained until 23rd July, 1930, when, as will be seen later, she was successfully refloated.

The "Moltke."

About this time the neighbouring hulls of the "Moltke" and "Seydlitz" were carefully surveyed, and plans were made to raise them. The "Moltke," a battle cruiser of 23,000 tons, was lying on a hard bottom, her masts, funnels and superstructure crushed beneath her weight, in some twelve fathoms of water. At very low tide part of the broad surface of her rusty hull appeared above water, and was a happy hunting ground for mussel fishers. The only way of bringing this ship to the surface was obviously that of lifting her upside down by means of compressed air, with such help as the floating docks might give when moored to her sides. She was resting on her gun turrets with an upward incline from her stern to her bow and a list of 16½ degrees. The first step to be taken was to seal up the openings in the hull and make them tight against external water pressure and internal air pressure. Air locks were attached to the surface of the hull, which were long enough to allow the work to proceed without interference from waves. The ship was finally divided into three sections, so that by subjecting some parts to air pressure and leaving other parts flooded, the necessary righting moment to correct the list was obtained. The original 16½ degrees list was by such means reduced, little by little, to 8 degrees, and by the use of the lifting power of the docks, a final list of not more

than 3 degrees was obtained. In this condition the air pressure was increased within the compartments, and she suddenly came to the surface on 9th June, 1927.

She was temporarily beached, and after being towed to the Lyness Pier was prepared for her voyage to Rosyth, where one of the large graving docks had been made ready to receive her. The operation of towing, which was undertaken by the Bugsier Reederei und Bergungs A.G., with their tugs, was uneventful, but on arrival at Rosyth Mr. Cox was faced with the responsibility of making the arrangements for dry-docking a battle cruiser upside down. This risk, after careful consideration, he decided to take, and the docking operation was entirely satisfactory, no damage being done to the dock and its equipment. The success of this unusual enterprise was due in part to the very substantial basalt rock base on which the dock was constructed, and the great care exercised by the divers in placing the packing blocks below the gun turrets and the parts of the hull on which the great weight was taken. Once again the enthusiasm and courage of Mr. Cox were justified and rewarded.

The "Seydlitz."

The next battle cruiser to be dealt with was the 25,000-ton "Seydlitz," work on which was begun as the final stages of refloating the "Moltke" were reached. This ship was lying on her side, and at low tide it was quite possible to gain access to many of the compartments and coal bunkers. In order to lighten the ship, it was decided to remove some of the 12-inch side armour and certain outside plates; in all about 1,800 tons of steel were taken off the ship and transhipped to Lyness Pier for cutting up and despatch. Much of this work was done by an improvised floating pontoon with a heavy jib crane on her deck. The outer armour and plating having been stripped off, a new deck—the 2-inch inner armour—was exposed. On this deck covered store and machinery spaces were erected for air-compressing plant and other machinery, the air supply being augmented by one of the firm's tugs, on which an air compressor had been installed and which was moored alongside the ship.

The hull was divided up into six different sections, and the water within the ship was gradually driven out under air pressure, the bulkheads being made good and new patches added as the work proceeded. The largest patch was that made to cover a funnel opening, which had a length of 46 ft., a width of 28 ft., and which was over 12 inches in thickness. Much burning away had to be accomplished, and care had to be taken not to make the ship too buoyant. In the Spring of 1928, when the air pressure on the different sections of the hull was being

balanced out, the failure of a large patch made common three forward bulkheads, and the righting moment thus created was so great that the ship turned through 48 degrees, and was only prevented from going right over by her masts and funnels. This accident crushed many of the already prepared patches, and work which had taken nearly nine months to accomplish had to be started all over again, new and longer air locks being fitted on to the uppermost surface of the hull. Towards the end of October, 1928, the hull went further over to a list of 50 degrees, but, it was eventually got under control, and, by careful manipulation and the assistance of lifting docks, it was rolled right over. Then, like the " Moltke," the ship was brought to the surface and eventually towed to Rosyth keel uppermost.

Two other ships to which brief reference must be made are the light cruiser " Bremse " of 4,000 tons, and the battleship " Kaiser " of 24,500 tons. The last-named ship was lying on her side in fairly deep water. Both ships were raised during the 1929 season, and towed upside down to the Forth.

The " Hindenburg."

Considerable interest attaches to the raising of the 27,000-ton battle cruiser " Hindenburg " on 22nd July last, and her safe delivery to Rosyth Basin. As mentioned before, the serious difficulty encountered in the early attempt to refloat the ship was the presence of some 20,000 tons of loose water in the ship, which accentuated the list as the pumping operations proceeded. Two things were necessary ; firstly, to ensure that the ship would not again list to port, and secondly, to place each set of pumps in such a position as would be best for its particular duties. To prevent the list, Mr. Cox hit upon the idea of casting a 600-ton block around the propeller brackets to support the port quarter of the ship. This was 40 feet long and 20 feet wide, with a depth of 20 feet. It was reinforced with steel girders, being practically encased in part of a destroyer hull. The 1926 patches were all inspected and renewed where necessary, and the 200-ton tripod mast cut away.

This done, pumping was begun ; six 12-inch pumps and twelve 6-inch submersible pumps being employed. All these were worked from the power units on the docks moored alongside the ship. When the bow of the ship rose, the concrete block held, but she began to list to starboard. Nothing daunted, Mr. Cox immediately suspended further operations, and proceeded to build under water a starboard quarter support of some 400 tons weight. This completed, four 12-inch pumps and eight 6-inch pumps, arranged in various parts of the ship with suction pipes lowered to the bottom of the engine and boiler rooms, were started up. The huge hull rose slowly from her bed, bow first, and without any appreciable

list and, when the full steadying effect of the centre part of the ship was felt as the water within the hull went down, the stern also started to come up. With the stern of the ship down, it was possible to hold the water with only four to six 6-inch pumps, thus enabling the larger pumps to be transferred to appropriate places aft. Here they were lowered through long 20 foot funnels attached to the deck of the ship.

The final stages were easily reached with only a few of the smaller pumps in operation, and the " Hindenburg " was again a floating ship. She was towed to Mill Bay, and after being equipped with an auxiliary engine room containing oil engine-driven generators, air compressors, and pumping plant, a new bridge having been erected, and all the patches re-inspected, she received Lloyd's certificate of sea-worthiness. On 25th August she left Scapa Flow for Rosyth, in tow of the three German tugs, " Seefalke," " Pontos " and " Ajax." The passage was made in the record time of two days, and the " Hindenburg " was berthed in the Rosyth Basin under the large crane, to be dismantled.

Conclusion.

Work is now well advanced on the 20,000-ton battle cruiser " Von der Tann," which lies in thirteen fathoms of water. This ship and the " Prinz Regent Luitpold," a battleship of about 25,000 tons also lying in deep water, form the present salvage programme. Access has been gained to the machinery spaces of the " Von der Tann," and they are now under air pressure, the object being so to distribute the air and water-filled spaces that the more deeply submerged stern of the ship will rise to the surface at the same time as the more accessible bow. In this ship, too, a slight list has to be corrected before lifting operations can finally be undertaken. As the water is driven out, deeper and deeper in the engine and boiler rooms, and bulkheads are made airtight, a probable danger exists in the sudden rising of the ship. For this reason work is only done at high tides, when the hull is submerged to the full and is not so sensitive.

In this short review only a slight idea of the varied interest and excitement of these salvage tasks has been possible, but it is hoped that enough has been said to indicate the unique character of the operations and to give some impression of the initiative and courage shown by Mr. Cox and his staff of salvage engineers

The material already recovered corresponds to a total displacement of over 130,000 tons. It has yielded alloy steels, non-ferrous alloys. and steels of shipbuilding and engineering qualities, purchased for re-melting. The principal markets for these disintegrated units of the one-time High Sea Fleet are, to-day, the steel and metal works in our country, the United States,—and in Germany!

THE EXPERIMENTAL BATTALION

(Being a Lecture delivered at the Royal Mongolian Institution by Captain Ah Chink, Royal Mongolian Infantry, with General Wee Ting Hatt in the Chair).

Proceedings Translated from the Mongolian by

BREVET LIEUTENANT-COLONEL R. H. ALLEN, M.C., R.A.

THE CHAIRMAN introduced the Lecturer, adding: "The theories of Captain Chink have become known to all students of contemporary military thought. He has kindly come here to-night to tell us about his Experimental Battalion. He is, as you all know, the Governor of Muktin Gaol and has been permitted by the Government to train a battalion of first-class political misdemeanants during the past year. I will now ask Captain Chink to deliver his lecture." (Some applause).

LECTURE

I should begin by explaining that the Government in authorising me to raise and train an experimental battalion from my prisoners also enabled me to enjoy the superlative advantage of a free hand in utilising bullets and live shell in the course of my experiments as I think fit. This concession has imparted a very valuable degree of reality to the whole trial. The personnel of the battalion has been drawn entirely from political offenders, mainly civil servants[1]; in which class Cash Mandarins predominate.

On field days I have no difficulty in finding volunteers for the role of skeleton enemy from disgruntled officers on the active list, who possibly ought to know better, but who consider the chance of a shot at a Cash Mandarin well worth the risk of a few casualties.

Umpires were provided from the War House in Pekin who on the whole performed their role creditably, though they were rather inclined to give decisions in favour of the battalion.

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[1] It is extremely difficult to find exact English parallels for certain Mongolian officials. The functionary we have here rendered "civil servant" is represented in the written language by an ideograph representing a series of concentric circles.—THE TRANSLATOR.

Let me first explain the process of reasoning which led up to my method of training. You have all heard and must agree with the saying "War is Fire, Fire is War." This saying, true when uttered, became increasingly so as modern fire arms improved. The final proof of verity was supplied in the European War of 1914-18. Here for three years attack was inevitably brought to a standstill by the streams of fire from the automatic weapons of the defence. During the last year the attack found means to overcome the defence either by taking refuge behind armour propelled by mechanical vehicles or else by the production of a mass of neutralising fire on the well-known "barrage" methods. That is to say, the whole of the defensive position was in turn neutralised by fire, or, profiting by the security given by armour, the attack was able to advance to point blank range and so identify and crush those small localities out of the whole defensive position from which fire still emanated.

Now you may well ask why should we seek for new methods, why should we not be content to continue those which served in the past. The answer is not difficult. We all know the immense casualties of the 1914-18 war, the vast expense, the appalling waste. We must seek methods which promise results more quickly and more cheaply. There are some who advocate our putting all our eggs into the "mechanical" basket. Why not concentrate on the production of a small highly mobile force entirely contained in mechanical vehicles? To this the reply is armour is always overtaken by the gun, all terrain is not suitable for mechanical vehicles, a mechanised army would experience appalling difficulties in the Argonne or the Judean Hills, the question of petrol supply in face of aerial attack bristles with difficulties. The mechanical maniacs will persist—why attack positions where guns are, why fight in the Argonne or Judean Hills, why not utilise the mobility of the vehicle, and move to a more suitable area; don't attack the Paladin, sever his umbilical cord.

I quite admit this theory has its claims, the indirect approach has appealed to many, from the great Captains of the Past to little Captain Fast of the present, but in the end it always comes to the push of the pike and the pike may have to be pushed by hand of man, and not by a petrol engine.

Thus I was led to reason that an army must contain certain troops able to overcome the fire of the defence by means other than the protection of armour. I am all for utilising armour and the self-propelled vehicle whenever possible, but there must be occasions when its use is prevented by the ground. On such occasions the limitations of existing material necessitate the use of the machine and field gun to produce the covering fire to enable the attack to close with the defence.

Well; the defence occupies a large area of ground, but on account of the volume of fire that can be delivered by automatic weapons, the locations from which the defensive fire emanates are literally spots. Further, these spots are so small as to be invisible at greater range than 200 yards, so we are forced to neutralise the whole defensive area in order to be sure of including these tiny spots. This entails for the attack a quantity of fire producing weapons with all their concomitant mass, expense, difficulty of supply, immobility, in fact the old static warfare we seek so desperately to avoid.

In imitation of the Europeans we have hitherto experimented with a system of successive concentrations, turning all our fire resources on fraction after fraction of the whole defensive system with frequent pauses to re-adjust the fire plan. But this method is cumbrous, slow, expensive in ammunition and very difficult to ensure. You may require to capture a locality, a hill or slope 600 yards deep and 800 yards wide. This seems small enough and comfortably within the fire resources of, say, a division. But consider further, what holds up the advance on this 800 yards front, not the automatic weapons therein but those to a flank, and these are effective at 2,000 yards at the very least. The fire of two machine guns posted some 2,000 yards to one flank or the other, if unneutralised, is quite capable of preventing the capture of this 800 yards of slope. So our problem gains; it is not a matter of 800 yards but of 4,800 yards of front that must be simultaneously neutralised.

So here was my problem. I could not utilise armour everywhere, I could not provide adequate covering fire everywhere, as the fire of the defence would emanate from so few spots in the whole area that my fire resources would be quite insufficient to neutralise the whole.

The method of progressive concentration is not really satisfactory. For this method involves for each locality the concentration of an utterly disproportionate mass of fire producing weapons; concentration means delay, delay means further protection for the defence by the spade, thus necessitating increased fire by the attack. So the process dawdles down the slope to static warfare.

Further, I envisage in the near future, another advantage for the defence, the provision of immediate protection by means of a light steel cupola carried on their mechanised machine guns. Such a cupola is within sight; if it is realised, then from the commencement of contact the machine gun of the defence will be secure against the great majority of neutralising fire of the attack which is produced by bullets or H.E. fragments. I see no reason why this form of protection should increase the visibility of the defence.

Here then is the quandary summarised. The attack cannot see the exact defence at a greater distance than 200 yards. The attack cannot inevitably use armour to get within 200 yards, the attack has not sufficient fire resources to neutralise locality after locality.

The situation I sought was (*a*) to get the attack within 200 yards by some other means; and (*b*) to ensure their fire supremacy when they got there.

I sought for (*a*) by obscurity, i.e., smoke;
I sought for (*b*) by marksmanship;

The first method requires little mention here as our existing resources are quite adequate. Under any conditions we have sufficient smoke producing pieces or methods to create the artificial obscurity necessary. All that remained was to train my battalion to move under cover of this obscurity, and even through it, if the wind were adverse, to within the requisite range.

The second method was obtained by equipping my battalion with very accurate rifles and telescopic sights and training them to work by pairs practically as scouts.

Perhaps I can best illustrate my methods by a brief description of an actual field day I carried out with one platoon of my battalion (all drawn from the Cash Mandarins) against a position held by a battalion of volunteers from the infantry. The defence occupied a position on a gentle forward slope devoid of cover and vegetation, in fact a "normal" country as defined by a high British military authority who laid down that Salisbury Plain and the Steppes of Russia were "normal," all others "abnormal" countries. The establishment was that laid down in the Mongolian War Establishment, i.e., three rifle companies and a machine gun company of sixteen machine guns. They were disposed in depth. There was a strongish wind, about 15 m.p.h., blowing straight from the defence to the attack, i.e., as unsuitable as you could have wished.

The attack consisted of two 6-gun 4.5 howitzer batteries and one platoon of Cash Mandarins. I had got the Cash Mandarins very fit and hard. I fell my platoon in behind a little ridge, pointed out the extent of the enemy position and settled as my first objective the line I have shown on this map as A-B. I was connected by telephone with the defence and before commencing I ordered them to open fire with all their machine guns. I forgot to say my demonstration was being watched by a delegation of European war experts. These were as intelligent as might be expected. Naturally from where we stood, 1,500 yards from the position, not a hostile machine gun could be located. I then ordered my howitzers to smoke A-B for seven minutes. During those minutes my Cash Mandarins trotted forward about 1,300 yards,

in pairs, on a front of about 1,000 yards. They had all taken compass bearings of their objective and carefully noted the lie of the ground. Under cover of the smoke they reached their objective without a casualty. Two umpires were hit, both D.A.Q.M.G's who *would* ride horses to exhibit their equestrian abilities.

The smoke cleared and not a sign was to be seen of my platoon. As trained by me, and in accordance with their natural habit, they were lying low. I may say that they were not burdened by equipment as is the custom in European armies. Each man carried a rifle, a water bottle, an iron ration, and 50 rounds of ammunition. When I shot big game I used to go out for a whole day with 10 rounds because I knew I was not going to shoot at over 150 yards. And I shot to kill not to brown. That is what I had trained my battalion to do.

Well, as I said, my platoon was established within 200 yards of what the British call their foremost line of defended localities. They had taken advantage of every little fold and hollow in the ground, and opened a slow but accurate fire upon the defenders. Armed with their telescopic sights their fire was deadly and soon the fire of the defence began to slacken. As it slackened my platoon started to infiltrate. Accurate fire was neutralising the defence. Now though this was in the nature of a field day, admittedly livelier than is the custom in Europe, yet the defence were in deadly earnest and the last men in the world to give in to the Cash Mandarins they had so often execrated. However, we could not afford to let casualties become too severe. Candidates for the infantry in these days of straitened means are so limited that we cannot afford to decimate them by field days as well as by financial strangulation. Consequently, the umpires had regretfully to blow the Cease Fire.

The experiment had been carried sufficiently far to prove that it is possible to neutralise defensive fire by accuracy instead of volume. Now, Sir, I think my time is drawing to a close and possibly the remainder may best be utilised if I endeavour to answer questions.

DISCUSSION

THE CHAIRMAN asked whether any officer would like to ask any questions.

LIEUTENANT-COLONEL BO PEEP: I myself am in agreement with the Lecturer to this extent that I consider that our infantry should endeavour to gain ground by means of their own resources, and not inevitably rely upon the assistance of other arms to carry them forward. I do think that their task would be greatly simplified if their regimental establishment included some form of "in-fighting" weapon such as a mortar. At present this problem is entirely one of communications. How can the man who locates an area of resistance pass the news on

quickly? I would finally ask the Lecturer whether he considers that a delicate instrument like a telescopic-sighted rifle could stand up to the strain and conditions of the modern battlefield.

THE LECTURER: As regards the rifle, I do not see why we should not be able to produce a telescopic-sighted rifle capable of withstanding active service conditions. As regards the "in-fighting" weapon I do not see why this should not be included in our war establishments. I have to-day only covered the first phase of my attack in which I have really only reverted to the old system of war, namely, that skirmishers precede the heavy columns. I quite agree that the modern equivalent of the heavy column might include an "in-fighting" weapon.

MAJOR GO BANG: I like the Lecturer's arguments, but with sixteen machine guns to a battalion, do you think we could ever affect the defence to any appreciable extent by the fire of rifles? I am frankly sceptical about it, especially in the type of country indicated. If it were in a hedged and a somewhat enclosed country, then I believe that infiltration by trained scouts would be very effective. If they could get round a flank and enfilade a line of machine guns, they would cause some fright, but in open country, without adequate artillery support, this last few hundreds of yards is an amazingly difficult job to tackle.

THE LECTURER: I am very glad that Major Go Bang agrees with me, under certain conditions, at any rate. I still adhere to my contention that owing to the vast area to be neutralized and the inadequate quantity of artillery available in moving warfare, artillery support is illusory and entirely confined to moral effect. As soon as a portable cupola for machine guns becomes universal, as I believe it will, then even this moral effect will vanish. The enemy machine gunner will soon discover that he is quite immune from danger when subjected to a field artillery concentration.

THE TUCHUN PORT: My views run very much the same as when I was responsible for the "Training of the Mongolian Soldier for War," some thirty years ago. I have always at the back of my mind two things, fire and morale. A man may be a good peace shot, but "windy" in war, and even if not, often have I found it impossible to locate a machine gun, even when only about 200 yards away, possibly owing to the way in which it spat fire—deadly straight—if I deigned to raise my head to survey the ground. In the open, one has a serious inferiority complex, and especially so as the machine gunner need hardly expose any part of himself. I think it would be a long, tedious and very risky job for even the best marksmen. The cardinal British mistake in their pre-war training in 1914, was to think that the man in the open—good fifteen-round-per-minute shot that he was—could be a match for the man hidden behind cover. The advantages of the gun for covering fire as against small arms lie in:—

(*a*) The moral effect of H.E., noise and damage;
(*b*) Power to search out cover;
(*c*) The man firing is not unduly disturbed by the immediate perils of attack.

I think this is what Frederick, Napoleon, Wellington and the Germans in 1870 all found and why they relied on important artillery so necessary to victory.

THE LECTURER: Naturally, I ascribe considerable importance to the views of the Tuchun. His experiences of the Thibetan War alone ensure the greatest weight being given to his opinion—quite apart from his connexion with The Golden Horde—but I would like to point out that while the pre-war training of the English relied upon the man with a rifle—not equipped with a telescope, I may say—that

of the French relied upon what the Tuchun describes as an " important " artillery. This policy did not lead to any considerable success in August, 1914. I do not wish to insist that my system is either infallible or suitable to all occasions, but what I do wish to emphasise is that this way of thinking in terms of spears, i.e., of men in mass relying upon the fire of another arm to carry them to handgrips, is doomed to failure, if, as to-day, the fire of that other arm is very nearly innocuous. The Tuchun referred to the Barbarian Napoleon. I think I am correct in saying that this Barbarian used two distinct systems. Initially he relied for success upon the skill and élan of a cloud of skirmishers which he inherited from the inchoate mass of the citizen Army. Latterly, as his infantry deteriorated, he relied more and more upon the massed fire of artillery. The turning point in this process was the Battle of Friedland.

THE CHAIRMAN

Well, Gentlemen, time is drawing short, so if no one else has anything to say, I will add one thing myself. I feel that war to-day, has reached the same state as war in what is called the Middle Ages, when the incomparable skill of our archers rendered attack by our foes completely impotent. As a result they, in turn, would retire within their castles, and as at that date we had no artillery, these were impregnable to our arms. So for a period of a century or so we had a situation of stalemate.

It only remains for me to thank Captain Ah Chink for his admirable, even if controversial, lecture and to say that I consider that the 5th Manchurian Fusiliers are fortunate in having produced an officer of such original views.

(Sporadic applause).

TRANSPORT OF INFANTRY MACHINE GUNS

By CAPTAIN F. H. JEBENS, The Prince of Wales's Volunteers.

THE faulty tactical and mechanical handling of Maxim guns in the South African War exercised a very adverse effect upon their transport in 1914. The only improvement effected therein was the substitution of the two-horsed L.G.S. wagon, carrying two guns, for the single horse-drawn cart carrying one. By the time (1916) that the urgent need for a greater number of automatic weapons was being met, position warfare had set in, with the result that methods of transportation ceased to be of primary importance. And so the limber came to be accepted, almost without question, as the European method of carrying infantry machine guns. A variation of transport was, however, introduced in countries unsuitable for wheeled vehicles, where the pack mule was, and is still, employed.

In evolving a new method of transport it would be advisable to try and retain the advantages and obviate the disadvantages of existing systems. The following table, therefore, shews the advantages and disadvantages of the limber as opposed to pack transport :—

L.G.S. WAGON .	PACK MULE.
Speed.	
Relatively great. Gun numbers can be carried in case of emergency.	Limited to speed, on foot, of mule leaders.
Cross-country performance.	
Fair.	Can follow infantry almost anywhere.
Road performance.	
Both types of transport can accompany marching infantry.	
Vulnerability.	
Large target difficult to conceal.	Can disperse—much easier to conceal.
2 weapons or 6,000 rounds in one limber.	1 weapon or 2,000 rounds only on each mule.
Neither type is in any way protected.	
Economy of personnel.	
1 driver per weapon.	4 leaders per weapon.

Required Characteristics of Mechanized Transport.

Let us now examine in detail the advantages which we wish to retain and others which we desire.

Speed.—We require the greatest possible speed across country, so that our weapons are on the move for the minimum amount of time. The entire gun crew must be carried.

Cross-country performance.—This cannot be too great. But here it is desirable to mention that our vehicle should be able to accompany infantry across country for a whole day without refuelling. This would necessitate a circuit of action across country of, say, 20 miles.

Road performance.—Vehicles must be able to accompany a bus column for a day's march without refuelling. This would necessitate a road speed of 30 m.p.h. and a circuit of action on roads of up to 100 miles.

Vulnerability.—Crew and engine must be protected against splinters and small arm fire. The vehicle should present as small a target as possible. It should be so organized that the disabling of any one vehicle will not put a gun and the whole of its crew out of action. (This constitutes one of the advantages of pack transport over limbers.)

Additional requirements.—The weapon should be mounted in the vehicle so that, in emergency, it could be fired therefrom. All vehicles should be interchangeable. It would be of great advantage if a vehicle could be found which is produced commercially.

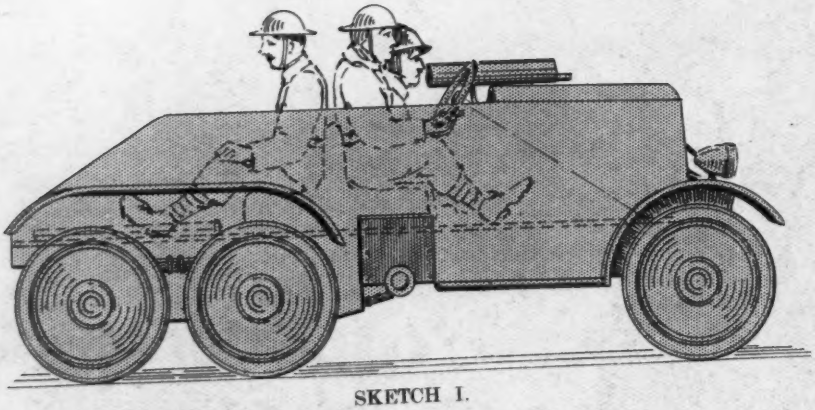
Types of Mechanical Machine Gun Carriers.

Before the introduction of the Carden Loyd, mechanical machine gun carriers all possessed certain drawbacks. They presented a large target. They were not protected in any way. They were designed to carry two guns and their crews. And the guns could not be fired from the vehicle. As these have all now been discarded for infantry, it is not proposed to discuss them further. But it is worthy of mention that the cavalry still employ this type.

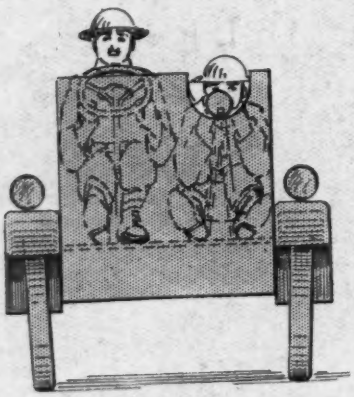
In the Carden Loyd a very definite advance has been made. Here we see a very small vehicle protected against S.A. fire and splinters. It carries only one weapon, and this can be fired from the vehicle. The crew are carried in a trailer.

In examining its performance, however, we must include the trailer. For most of the advantages of mechanization are discarded unless the crew normally accompanies the weapon.

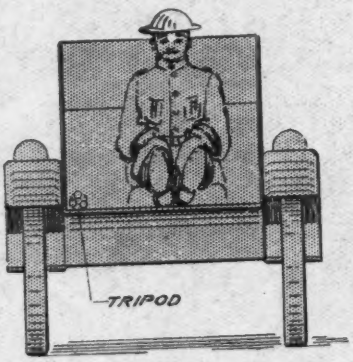
The following figures are not official, but have been obtained from practical experience of the vehicle with trailer :—



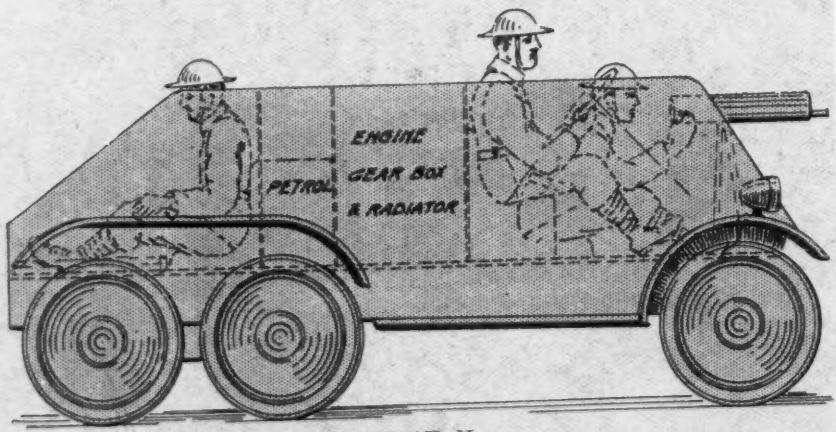
SKETCH I.



FRONT
SKETCH I.



REAR
SKETCHES I & II.



SKETCH II.

Average speed	across country	6 m.p.h.
	on road	15 m.p.h.
Circuit of action	across country	15 miles
	on road	35 miles

It can be seen, therefore, that we are still far from the performance aimed at. Moreover the substitution of a more powerful engine, whilst improving the performance, is likely to decrease the circuit of action owing to greater petrol consumption.

In addition there are certain other shortcomings. The organization is still based on the limber principle whereby " many eggs " are in one " basket." That is one gun and crew can be completely immobilized by damage to a vital part of the Carden Loyd. The machines are purely Army vehicles. They are useless commercially and correspondingly expensive. They are relatively complicated pieces of mechanism requiring a high standard of training for efficient upkeep, repair and handling. It must be remembered that they are to be used and maintained by the infantry soldier.

Conclusion.

It is to be doubted, therefore, whether we are yet on the right lines. And the suggestion follows that we should work on the line of " mechanized pack " with a type of machine and organization which will now be explained.

Mechanized Pack M. G. Company.

It is suggested that a suitable vehicle could be built on the chassis of the existing commercial six-wheeled Trojan van. Sketch No. 1 shews a suggested armoured body on the standard chassis. Sketch No. 2 shews a body on a chassis slightly altered to make it even more suitable. It may be noted that with the new system of steam cooling the position of the radiator is immaterial.

Load.—If these bodies were made of $\frac{1}{8}$-in. steel they would be protected against S.A. fire (non-armour-piercing) and splinters at a range of 200 yards and over. Whilst below this range they would be proof against all S.A. bullets not striking at 90°. The weight of these bodies would be about $2\frac{1}{2}$ cwt. The useful weight carried would consists of :—

Gun Vehicle	Gun and tripod 2 belt boxes Gun mounting 3 men	say $6\frac{1}{2}$ cwt.
S.A.A. Vehicle	Gun mounting 2 men S.A.A. 2,000	say $6\frac{1}{2}$ cwt.

As the load capacity of the vehicle is 9 cwt. and these estimates are liberal, the vehicles would not be overloaded.

Cross-country performance.—This is surprisingly good. The vehicle can ford 18 in. of water, while it can travel across all but very rough country comfortably at 10 m.p.h.

The writer travelled in one of these vehicles when the load carried was 9 cwt. deadweight and two men. Under these conditions we travelled over ground and climbed gradients that would almost certainly have stopped a Carden Loyd with trailer and full load. Over a rough but level field we reached a speed of 15 m.p.h. without undue strain on the chassis.

Road performance.—The cruising speed of the fully loaded lorry is 35 m.p.h., while it can attain a speed of over 40 m.p.h.

Circuit of action.—Going across rough country the vehicle can cover 25 miles on a fill, whilst on the road its circuit is over 100 miles.

Maintenance and control.—The Trojan 10 h.p. engine is a two-cylinder two-stroke. There is practically nothing to go wrong in its mechanism. Its maintenance is a much cheaper and more simple matter than that of the normal type of engine. The six-wheeled chassis would, presumably, present no more difficulty than a track chassis. The control of the vehicle is very simple indeed, and it would be an easy matter to train men to become efficient in driving and maintenance.

ORGANIZATION OF THE COMPANY.

(1) *Establishment of vehicles :—*

Coy. H.Q.	1 Coy. Comdr's reconnaissance vehicle.
each Platoon H.Q. ..	2 vehicles.
1st Vehicle	Range Taker (Driver).
	Platoon Commander.
	Platoon Sergeant.
	1,000 rounds.
2nd Vehicle	Batman (Driver).
	2 Signallers.
	1,000 rounds.
each Gun	2 vehicles.
1st Vehicle	No. 3 Driver.
	No. 1 Driver.
	No. 2 Driver.
	500 rounds.
2nd Vehicle	No. 4 Driver.
	No. 5 Driver.
	2,000 rounds.

Thus a company would consist of 41 vehicles carrying 3,000 rounds per gun.

(2) *Establishment of Personnel.*—Each gun vehicle carries the driver and Nos. 1 and 2, so that the vehicle may be driven up to the gun position and away to cover as soon as the gun is unloaded.

The S.A.A. vehicles are driven direct to their cover when all drivers will at once become available for S.A.A. supply to the gun.

No. 6 has been omitted intentionally. Under the old organization one of the higher numbers of the gun team was the scout. There is no object in having this man when teams are carried in groups of two or three.

The Section Leader would make the third man in one of the S.A.A. vehicles of his section. This might necessitate a slight reduction in the S.A.A. carried in that vehicle and a corresponding increase in the others. But we have worked well within the load capacity of all vehicles.

It is claimed that the suggested unit would be easy to train in driving, control and maintenance, whilst, owing to its organization, it would retain its efficiency in the face of casualties for a longer period and with less effort than any unit organized on the limber system. It could certainly accompany the battalion either fighting or with a bus column for a day without refuelling.

FINANCE.

It is realized that at the present time any suggestion involving increased expenditure cannot be contemplated. As all estimates must, of necessity, be only approximate, nothing would be gained by producing actual figures. It must be sufficient to state here that the cost of the suggested unit has been carefully examined. In actual fact the initial cost of the proposed organization should be about the same or possibly very slightly in excess of that of a company equipped with Carden Loyds. But against this can be put a much reduced running charge and a very small repair bill indeed. Add to this the reduction in the establishment of the gun team, and the suggested organization should represent a very substantial saving.

CRUISER TYPES

SOME UNITED STATES VIEWS

PROFESSIONAL discussions before, during and after the London Naval Conference have centred repeatedly round the question of cruisers; their numbers, and their size, armament, speed and other attributes. Nowhere has opinion been more sharply divided than in the United States. That nation, moreover, under the terms of the London Naval Treaty, has ample scope for building. It is of interest, therefore, to see what is the trend of views which may influence their cruiser construction in the near future.

As regards numbers, American claims are inspired mainly by the desire not to be second to any other nation in any respect, and the intention that the United States shall be free to trade with whom they please in time of war. They also seek to ensure a definite superiority over the Japanese fleet in this as in every other fleet unit. The agreement come to at the London Naval Conference meets these claims, but still leaves considerable latitude for varying details of design, and even some choice as regards numbers of the largest type which may be built.[1] This has already produced a variety of views, not only on the advantages of the 8-inch gun cruiser over the 6-inch class, but also on the merits of speed, armour, endurance and facilities for carrying aircraft.

Arguments in favour of the largest type of cruiser are generally based on the contention that, as compared with Great Britain, the United States has far fewer naval bases, and a much smaller number of fast merchant ships suitable for conversion into auxiliary cruisers. Therefore a certain school regards it as essential that America should have cruisers with great endurance and a more powerful armament than can be mounted in such auxiliaries.

But, as remarked in the last JOURNAL, American opinion as to the necessity for, and value of, a particular type has, of late, shown signs of changing, and, whereas before there seemed to be an overwhelming demand for the largest possible ship with the maximum number of the largest permissible guns, a number of senior officers in the United

[1] See R.U.S.I. JOURNAL for May, 1930, p. 399.

States Navy has come to appreciate that the smaller and more lightly armed cruiser also has its uses. Even that uncompromising advocate of the 8-inch gun type, Admiral Hilary Jones, had to admit before the Foreign Relations Committee of the Senate that there were conditions "in which the 6-inch unit would be more valuable than the 8-inch."[1] Somewhat to his discomfiture, he was confronted with a letter he had written to the Secretary of the Navy in June, 1929, and in which he had pointed out the advantages in a fleet action of the lighter, hand-loaded gun, with its greater rapidity of fire, against destroyer or submarine attack; also the relative lack of protection in existing 8-inch cruisers, and their consequent vulnerability to 6-inch gun attack when within 6-inch gun range; likewise the danger of attaching an exaggerated importance to the greater range of the 8-inch gun. It is true that his letter seems to have been written mainly with the object of emphasizing the value of British 6-inch cruisers, but it somewhat weakened the strength of his arguments against accepting fewer 8-inch ships than the States originally desired to claim.

Admiral Schofield, the newly appointed Commander-in-Chief of the Battle Fleet, and Admiral Reeves,[2] lately a member of the General Board, and now commanding Aircraft Squadrons, are out-and-out advocates of the 8-inch gun cruiser and of that type alone. On the other hand, Admiral Hepburn, lately Chief of the Staff to the United States Fleet, and one of the naval representatives at the London Naval Conference, has said that if he had his way he would build no more 8-inch ships. Admiral Moffett, Chief of Naval Aeronautics, has, characteristically, condemned both types as useless, as in his opinion they would be ineffective against attack from the air in any future war.

All this diversity of opinion seems to point to the necessity for a clear understanding as to "what the cruiser is required to do." In a thoughtful analysis of the problem by Lieutenant F. G. Percival, U.S. Navy (Retd.), in the *United States Naval Institute Proceedings* for May of this year, the author heads his article by a quotation from Mahan, in which that able, but verbose, writer expresses the same idea in five times as many words.

Recalling the origin of the largest type of all, the battle cruiser, this writer observes "The British seemed to make the usual mistake, and pictured the battle cruiser as fighting the smaller and weaker armoured cruiser which preceded it, for they protected their first vessels of this type with only a 6-inch armour belt. The German designers,

[1] *Times*, 20th May, 1930.

[2] One of the American Naval Advisers at the Geneva Conference.

however, realised that their battle cruisers must fight similar ships, and upon occasion, battleships ; consequently they insisted on a well-balanced design, even though it necessitated some sacrifice of speed, cruising radius and armament. That the early British design was an admirable destroyer of armoured cruisers was strikingly demonstrated at the Falklands ; but that the German design represented the sounder view was even more strikingly demonstrated at Jutland."

This is not quite fair to the originators of the battle cruiser. In his biography of Lord Fisher,[1] Admiral Bacon says that the " Invincible " class were intended to provide a type of ship " fast enough to hunt down any armed merchant ship afloat, and at the same time to be able to fight any cruiser afloat." The word " fight," he adds, meant with Fisher to " crush." " For weeks," we are told, " discussion continued about the armament of the ' Invincible '—9.2-inch *versus* 12-inch ; but in the end the 12-inch gun won, on the unanswerable plea that ships of the size and tonnage necessary in order to build an ' Invincible ' should have an additional use in being able to form a fast light squadron to supplement the battleships in action, and worry the ships in the van or rear of the enemy's line. They were never intended to engage *battleships single-handed.*" At this time no German battle cruiser had been designed, moreover, we had a great preponderance in battleship strength, so there was no question of battle cruisers having to take the place of battleships. When the German ships did appear, it is true that they were better protected than their British contemporaries, but this was done at the price of several knots speed, and we still had superiority in numbers, and in calibre of guns. Where our battle cruisers failed at Jutland was in their fire effect, and because they lacked proper anti-flash devices in the turrets, rather than because of their unduly thin armour. For one reason or another the gunnery of the British battle cruisers was not as good as that of the German ships, while our shells were seriously defective. Nevertheless, the superior protection of the German ships undoubtedly served them well, not only during the battle cruiser engagement, but especially at a later stage when they came under the concentrated fire of our battle fleet.

As Lieutenant Percival remarks, the result of this experience was to produce the " Hood " with her improved protection without sacrifice of speed or gun-power. Such a ship, however, meant increasing the displacement from 30,000 to over 40,000 tons, and when " super-Hoods " threatened to appear, the naval Powers took fright and deemed it time to call a halt ; whence came the Washington Agreement and a limit

[1] The Life of Lord Fisher, by Admiral Sir R. H. Bacon. Vol. I, p. 253, *et seq.*

of 35,000 tons and 16-inch guns for battleships and battle cruisers, and of 10,000 tons and 8-inch guns for cruisers.

As the same writer says, the effect of the agreement has been largely to put an end to attempts to outclass each new design of a rival by building bigger and ever bigger ships; but competition still exists in the endeavours to make the best use of limited tonnage. He then proceeds to classify cruisers as follows:—

(*a*) The Battle Cruiser Type—7,100 to 10,000 tons displacement, with an armament of 7.5 or 8-inch guns, and 29-36 knots speed.
(*b*) The Battleship Cruiser Type—of which the "Ersatz Preussen" is the sole representative.
(*c*) The Aircraft Carrier Type.
(*d*) The Destroyer Type.
(*e*) The Submarine Type.

THE BATTLE, OR FLEET, CRUISER.

Discussing the functions of the first type, the author says: "In view of the exorbitant price which must be paid for high speed, we conclude that these vessels were designed primarily for those functions in which maximum mobility is an absolute necessity. These are:—scouting, supporting or breaking up destroyer attacks, raiding, and hunting. The first of these roles has been taken over by scouting planes in such weather as permits their operation. It is consequently of greatly reduced importance and will likely continue to diminish with probable improvements in planes and aerial navigation. Hence, scouting must now be considered a secondary role for these cruisers. The primary fleet function of this type is, therefore, assisting or repelling the onslaughts of destroyers. This view is supported by the fact that both England and Italy have recently announced the laying down of cruisers which appear to be designed to fight torpedo craft rather than other cruisers. Our problem is, then, to design a cruiser with the primary object of supporting or breaking up destroyer attacks, while not losing sight of its suitability for raiding, hunting and scouting.

"In deciding what sort of cruiser is best adapted to this duty, the first thing to be settled is its size. The small cruiser has the advantage that it affords a reduced target to gunfire, has greater manœuvrability, and that its 6-inch guns are probably better suited to fighting destroyers than are the 8-inch guns of the larger cruiser. The trouble is that they will have to fight and defeat other cruisers before they can turn their attention to the hostile destroyers. When it comes to engaging the former, the advantages of size and gun power are apparent; and we see the futility of building a warship with the sole idea of fighting a

smaller and weaker vessel, while ignoring the fact that it must be able to fight ships of its own class.

" One argument against the big cruiser is that it is large enough to afford a tempting target to the main battery guns of battleships. It seems very unlikely, however, that any destroyer attack will be pushed home, except under cover of darkness or a smoke screen, unless the enemy battleships are so closely engaged with our own that they cannot afford to turn their big guns elsewhere. A 10,000-ton ship, moreover, affords only a slightly larger target than one of 6,000 tons. This argument, therefore, need not be taken too seriously. If we agree on this point, the obvious conclusion is that the displacement of these cruisers should be the maximum allowed by the treaty.

" Since this type must be designed primarily for fighting other cruisers and secondarily for fighting destroyers, it is obvious that it should have more protection than has been given earlier vessels of this class. Manifestly, these ships should have reasonably adequate protection against 8-inch shells. This would automatically provide immunity to any projectile fired by destroyers or destroyer leaders, even though the range be point-blank. It would also take care of medium sized bombs. Such protection can be obtained only at the expense of armament or speed or both. How much may these qualities be reduced ?

" To begin with, it is proposed that the number of 8-inch guns be reduced to six, mounted in two triple turrets. There can be no question that this battery is sufficiently powerful to sink in short order any treaty cruiser afloat to-day. The 8-inch shell can so easily defeat the armour carried by these large, scantily protected vessels, that it is simply a matter of getting on the target. This is one of the points recognized by the Germans when they put only six guns in the main battery of the ' Ersatz Preussen.'

" Nobody questions either the offensive necessity or the defensive value of well-directed gunfire ; but, in the piping times of peace, many of us forget that this depends upon several things besides the number of guns. First of all, the gun platform must be kept afloat and on a reasonably even keel, with the machinery intact, while the guns and operating personnel must be behind sufficient armour to enable them to continue to function in spite of a few hits. All of this calls for protection, since we must expect the enemy to open fire as soon as we do. Next, there comes the relative skill of the operating personnel. Armour begets confidence and makes for increased efficiency under the trying conditions of battle. Last of all, there is the element of chance. This is far more apt to go against a cruiser which has so little protection that it can be blown up by a single lucky hit than it is to go against

one capable of standing a reasonable amount of punishment. So, on closer examination, we see that robbing a vessel of armour in order to overload it with guns reduces rather than increases its chances of maintaining a well-directed gunfire *under the conditions of actual battle.*

" Then, if we succeed in defeating the hostile cruisers, our own cruisers must be able to deal with destroyers. For use against these totally unprotected vessels, the 8-inch gun is unnecessarily large and too slow in firing. Of course, the main battery should be turned against destroyers after the larger ships are out of the way, but it must be supplemented by something else. The exposed position which these cruisers must take at times in the discharge of their duties demands that they be given an unusually powerful anti-aircraft battery. The weapon now most favoured for this purpose is the 5-inch gun. If several of these were mounted with due consideration for their arcs of fire, they could be used with great effect against destroyers. This gun possesses ample range and destructive power to deal with such vessels. When we have obtained these qualities, any increase in calibre simply represents wasted energy and, of greater importance, wasted tonnage. Although, in the absence of concrete designs, one cannot be dogmatic, a battery of nine 5-inch guns mounted in three triple turrets would prove highly effective against either destroyers or aircraft. These should be supplemented by several automatic guns, also mounted in turrets, and the usual torpedo armament.

" The next question is, how far do we dare reduce the speed of these cruisers in order to meet the other requirements and still enable them to discharge their allotted functions ? It has long been an article of faith that they should be slightly faster than contemporary battle cruisers. This claim is now of greatly reduced importance. To begin with, the cruiser has been displaced by the airplane for scouting in clear weather. In any contact in thick weather, the outcome will not depend upon a slight difference in speed.

" When these cruisers are used for independent duty, they now face a different situation, due to the aerial scout. This means that contact will usually be established at much greater distances than formerly. Suppose, for example, that one of these vessels discovers a superior force sixty miles away, that the pursuit is started immediately, that the pursuers have a four-knot superiority in speed, and that there remain ten hours of daylight. The pursuers will gain only forty miles and still be twenty miles away and hopelessly out of range when darkness falls. Of course the situation might be such that the slower vessel could be overhauled, but our point is that a few knots difference in speed is not the crucial matter that it was when contacts were made at visibility distance.

" Future hunting squadrons, however, will probably be accompanied by an aircraft carrier whose planes will be launched in attacks as soon as the raider is discovered. Then the safety of the raider will depend upon its anti-aircraft batteries and protection, rather than upon extreme speed. The latter quality will never enable any class of surface vessel to run away from any aerial attack. We may say that, in the average situation, *speed alone no longer spells safety for a cruiser or any other type of warship.* That dearly bought quality will seldom be needed for avoiding other surface vessels, thanks to the aerial scout, and is of negligible value for avoiding aerial attacks, while *safety and, of greater importance, combat efficiency do depend upon those qualities which can be obtained only by sacrificing speed.*

" Another point in this connection is that, if the Washington Treaty remains in force, it is doubtful if any more battle cruisers will be built. If they are built, it is fairly safe to say that their speed will not be over 28 knots.

" If we agree that speed is of greatly reduced importance for either pursuit or escape and that a few knots either way make comparatively little difference, what is the maximum speed that can be attained after first providing the armament and protection previously specified? If we may judge from existing ships, this would probably be 30 knots. When the Japanese were able to get six 8-inch guns and 33 knots on 7,100 tons in their ' Furutaka ' class, we should be able to get six somewhat longer 8-inch guns, a stronger anti-aircraft battery and adequate protection on 10,000 tons, particularly since we are reducing the speed from 33 to 30 knots.

" Even if it were necessary to drop to 29, or possibly as low as 28 knots, it is submitted that the resulting design would still be better able to meet the changed conditions of modern war at sea for the following reasons: it could defeat in a gun fight the present 10,000-ton cruiser of 31-36 knots; it could cope more effectively with destroyers than that type; it would be better fitted to meet the aerial menace because of its protection and its powerful battery of A.A. guns; it would be even more effective as a destroyer of destroyers than the small 6-inch gun cruiser, because it would have sufficient protection to be immune to any gun carried by a destroyer, and because its 5-inch battery would be as effective against the destroyers as the 6-inch battery of the small cruiser, while the addition of the 8-inch battery would be so much clear gain; it would still have enough speed to operate with destroyers, to keep clear of probable future battle cruisers and, with aerial scouting, it should be able to avoid even the present 32-knot vessels of that type.

"We advocate then, a battle cruiser type of cruiser having a displacement of 10,000 tons, six 8-inch guns, nine 5-inch guns, several automatic guns, two triple torpedo tubes, 28-30 knots speed, the usual aviation equipment, and reasonable protection against 8-inch shells."

The importance of protection has evidently impressed the minds of a considerable school of thought in America. Commander Holloway H. Frost, U.S.N., who has written a series of articles for the *Washington Post*, alluding to the necessity for 8-inch cruisers, says: "This lack of protection is an important defect, now becoming generally recognized. Fortunately the United States alone among naval Powers has the opportunity to remedy this defect in part. All the British and Japanese 8-inch cruisers permitted by the Treaty are either built or building. Additional armour would weigh them down beyond their tonnage limitations. We, on the other hand, have still eight 8-inch ships to lay down. At all costs, even if a reduction to six guns is necessary, they should be armed against 8-inch shell fire. Eight ships of this design would give us an immense advantage over the other naval Powers."

This writer also applies his argument to 6-inch cruisers. He points out that this class may be built up to the full displacement of 10,000 tons, and advocates that in their design absolute priority should be given to the provision of armour to stop 8-inch projectiles.

According to the *Chronicle* of the 3rd May last, ten of the eighteen 8-inch gun cruisers allowed to the United States will be far superior in armour protection as well as in all-round fighting ability to any previous ships of the class. Vital parts, it is stated, will have 4-inch to 5-inch armour plating as compared with 2½-inch in the previous class. The increased weight is to be offset by lighter propelling machinery, the use of aluminium for furniture, etc., and a more extensive substitution of welding for riveting.

THE "ERSATZ PREUSSEN" TYPE.

To counter the new German battleship type cruiser, Lieutenant Percival proposes that the United States should build to a design for a ship of 10,000 tons but mounting nine to twelve 8-inch as compared with the German ship's six 11-inch. There would also be a powerful battery of 5-inch guns. Protection would be provided against 8-inch shells and speed would be only 21.25 knots.

Such a type would, he says, be able to engage two or even three of the fast flimsily protected cruisers with reasonable chance of success. As compared with the new German ship, he adds: "It could not, without aerial superiority, stand up to the heavier guns carried by the 'Ersatz Preussen' in a long-range engagement; but it is noteworthy

that the latter type or a superior vessel can be built only by the weaker naval powers, and only out of capital ship tonnage. If we should become involved in a war with such a power, we would not only have our own capital ships available to escort convoys; but also, if they used their smaller capital ships for commerce raiding, we would have an excellent opportunity to cut off and destroy them. In any war with a weaker navy, the chief difficulty is to entice their vessels out for an engagement. If they employed their capital ships in destroying commerce, they would simply play into our hands.

" Nor should we need battle cruisers to run them down. An aircraft carrier, accompanied by a battleship and four to six large ocean-going destroyers, would form an ideal hunting squadron. The planes of the carrier would be invaluable for locating the raider. If he sought to escape, the planes would constitute a striking force of great power and of incomparably higher speed than any battle cruiser. They could certainly disable, if not destroy him. If he were disabled or were inclined to stand and fight, the battleship could soon settle things. The destroyers would provide the necessary offence and defence for contacts in low visibility, as well as constituting an anti-submarine screen in clear weather. Thus we would have an invincible combination, regardless of weather conditions."

Referring to the question of convoy protection in the event of war with one of the leading Powers, this writer remarks: " Unquestionably a battleship would afford more protection to a convoy than our proposed battleship type of 10,000-ton cruiser; but, if at war with a great naval Power, we could not afford to disperse our capital ships for the protection of convoys. For that we must depend upon vessels of 10,000 tons or less. In other words, would our proposed 21-25 knot cruiser afford more protection to a convoy than one of 32-36 knots? This must certainly be answered in the affirmative. The one possible advantage possessed by the faster cruiser would be the ability to run away from an attack made by superior forces, and it could not do even that, if the raiding force included an aircraft carrier."

For combined operations, the author considers his proposed slow, heavily armed battleship type cruiser would be invaluable on account of its shallow draft, its stout protection, including that given to the guns crews, and the nature of its armament. The latter would provide a heavy battery (8-inch) for long range bombardment, and, if necessary, anti-aircraft work; a 5-inch battery for counter-battery work, or against exposed troops, machine-gun nests or aircraft; and a battery of small automatic guns, mounted in turrets for use against machine-gun nests, exposed troops, aircraft or torpedo motor-boats.

Such a ship, he contends, would be an adequate reply to the " Ersatz Preussen," and more suitable for American requirements.

THE AIRCRAFT CARRIER CRUISER.

The substitution of light bombing aircraft for 8-inch guns in the 10,000-ton cruiser is a question which, this writer considers, can be postponed for some years, as it is of less importance than the provision of battleship type cruisers to defend the existing large carriers. He thinks that the offensive functions of cruisers could " be more effectively discharged by small carriers, *in such weather as permits flying.*"[1] But the problem is " to what extent carriers can replace the cruisers in view of the limitations imposed on aircraft by weather."

Commander Frost, on the other hand, draws attention to the fact that the London Treaty makes special provision permitting landing decks for aeroplanes to be fitted in 81,000 tons of their cruiser quota, and suggests a design of ship displacing the full 10,000 tons but armed with six or nine 6-inch guns in turrets forward and a landing deck and four catapults aft. In a hangar below, would be stowed twenty light bombing machines capable of carrying 300 lb. bombs each. The ship would have an endurance and speed equal to the 8-inch class, and would be armoured against 8-inch projectiles.

He advocates utilizing the 73,000 tons of 6-inch cruisers allowed to the United States under the Treaty, as follows :—

40,000 tons.	Four 10,000-ton ships, with twelve 6-inch guns each, armoured against 8-inch shell.
20,000 tons.	Two 10,000-ton ships, with nine 6-inch guns, and twenty aeroplanes each, armoured against 8-inch shell.
13,000 tons.	Six 2,166-ton ships, with five 5-inch guns and twelve torpedo tubes each, speed 35 knots; as destroyer leaders.

DESTROYER TYPE CRUISERS.

Continuing his analysis of the various types, Lieutenant Percival says " it was realised that there were some cruiser functions which did not require the maximum size and fighting power, and for which the requisite numbers could consequently be obtained at much less expense by reducing displacement. The Japanese solved this problem by building a small cruiser, while the French have gone in for large

[1] Lieutenant Percival's italics.

destroyers.[1] The latter appear to be the soundest solution, for they meet cruiser requirements, and are at the same time excellent all weather destroyers, with unprecedented cruising radius for this type."

SUBMARINE TYPE CRUISER.

The submarine cruiser is merely noted as being the vessel which now performs such functions as observation of enemy ports, scouting ahead of the fleet and commerce destruction in waters where surface raiders cannot operate. These were formerly performed by high speed surface cruisers, whose field of usefulness is correspondingly diminished.

THE FLEET FLAGSHIP.

Finally, Lieutenant Percival advocates a specially constructed 10,000-ton aircraft carrier as fleet flagship.[2] He says, "The crying need of both Jellicoe and Scheer at Jutland was information; most of the time both Commanders-in-Chief had only a vague idea of what was going on. With the ever-growing multiplicity of weapons and consequent complication of fleet tactics, the need for intelligent and constant co-ordination of all arms is greater than ever. How can any Commander-in-Chief properly exercise his functions in a vessel in the battle line. . . . The advent of the observation aeroplane has also effected the situation. In any future naval battle it will be a priceless advantage to the Commander-in-Chief if he can send trusted officers of his own staff up to get special information and report in person. It is not unlikely that he will want to keep one or more officers of his staff in the air throughout the battle. . . . This might suggest that one of the large aircraft carriers be used for the flagship, until we recall that the tactical employment of these vessels would almost preclude any personal observation by the Commander-in-Chief. In other words, so far as what the Admiral could see is concerned, he might almost as well be ashore as on a carrier if the carrier proceeded uninterruptedly with flying operations."

The proposed Fleet Flagship would be a vessel of 10,000 tons with a speed of between 24 and 29 knots, depending upon the speed of the future battle fleet. Since it would always be screened by more powerful vessels, the usual main battery of 8-inch guns would not be needed. It should, however, have an unusually powerful battery of anti-aircraft

[1] The author quotes the Japanese "Yubari" and French "Chacal" as typical of each class.

[2] Similar views have been expressed in the R.U.S.I. JOURNAL of August, 1929; see "The Fleet Flagship-Battleship or Aircraft Carrier," by Lieutenant A. M. Kimmins, R.N., p. 562.—EDITOR.

guns, both 5-inch and 37 mm. The usual armoured belt might be omitted, but a curved protective deck, proof against medium-sized shells or bombs, should be provided. This suggestion seems likely to prove something in the nature of an intelligent anticipation, for it is reported on good authority that the 10,000-ton cruiser " Chicago " is being fitted as a fleet flagship, and that on completion in March, 1931, she will relieve the battleship " Texas " as flagship of the Commander-in-Chief, United States Fleet.

Summarizing his conclusions, this author says " The question then arises, what are the needs of the United States Navy for these various types? We have ten ' Omahas ' built, ten fast 10,000-tonners under construction, and thirteen 10,000-tonners authorized but not laid down[1], besides seven cruiser submarines built, building, and authorized. We have no cruisers of the battleship, aircraft carrier, or destroyer types. The latter can wait until we replace our present destroyers. While the value of the aircraft carrier type is undeniably great, it is useless to build any of them until we have provided enough cruisers of the battleship type to defend the larger carriers already completed or authorized. Obviously then, our greatest need is for the latter class of cruisers and for a specially constructed fleet flagship."

[1] Under the London Naval Treaty, the United States is only allowed a maximum of eighteen 10,000 ton cruisers.—EDITOR

INDIVIDUAL TRAINING

By LIEUTENANT-COLONEL J. McM. MILLING, M.C., *p.s.c.*
1st Battalion, The Bedfordshire and Hertfordshire Regiment.

I.

ON two previous occasions an attempt has been made to show that:—

(*a*) The (then) training of the regimental officer in the higher art of war was insufficient;

(*b*) The individual training of the private soldier, as at present carried out, is out of date.[1]

The present discussion follows on the above arguments as a species of corollary which should be considered in conjunction with them, in so far as it puts forward, tentatively, certain methods which appear to put into practice the theories previously advanced.

Attention need first be drawn to the fact that these theories have been put to the test in India, where conditions are not entirely similar to those prevalent at home. Nevertheless, despite the exigencies of British weather and climate, which in the winter months do certainly complicate outdoor tactical training, the suggested methods should in the main be equally applicable to Britain.

Moreover, it is our intention to touch but lightly on the training of the officer. It is in the matter of the tactical training of the private soldier—and this, it seems to us, does not apply solely to the infantry—that the real interest lies. This training, therefore, will become our main theme, since in the one case it is only a matter of *means*, whereas in the other it is one of *method*.

II.

The training of the officer, it seems, must resolve itself into dealing with the *time* factor. Once this problem is solved, the manner and method of instruction becomes quite normal and merely a matter for individual decision. Naturally, there may be many ways of doing this. Actually, in the instance under review, two classes were held, each of five weeks duration, during April to June, devoted to the study of tactical and administrative problems and demonstrations; in addition there was instruction in Military History and Law, the writing of English, orders and appreciations, etc. Half the available officers, belonging mainly to the companies undergoing training, attended each class, the remaining half acted as duty officers. The guiding principle throughout was that compulsory work only was done during normal working hours, four of which were set aside daily for this purpose, making a total of a

[1] See R.U.S.I. JOURNAL, August, 1928, "The Training of the Army Officer," and August, 1929, "The Training of the Infantry Soldier."

hundred working hours for each class. To enable officers to attend with regularity, all individual training of the private soldier was taken over by the warrant officers and n.c.o's of the companies concerned.

There is no doubt that such class work proved of considerable value, both to instructors and instructed, but it actually brought out three very definite conclusions:—

(i) That, with some such general method of training officers regimentally, the rather doubtful proposals for junior Schools of Tactics should die a natural death;

(ii) That a knowledgeable, and therefore *trained*, senior major is essential to the scheme—preferably an appointed second-in-command.[1] It is a sheer impossibility for a Commanding Officer to run such a course of instruction, and it is not every Commanding Officer who can enjoy the good fortune to have a *p.s.c.* officer at hand to undertake such a task;

(iii) That synchronization of training by higher authority is absolutely necessary, in order that outside work shall not clash with the classes, or periods, of unit instruction.

III.

If we now turn to the private soldier, we appear to find in certain quarters an inclination to devote to the rifle and the bayonet, the material things, somewhat undue weight. And why? Maybe it is on account of the text books, because there may exist a tendency to misread their true implication. For instance, we find the statement in Infantry Training, Vol. II.: "The rifle and bayonet are the principal weapons of the infantry soldier; the victory can be completed by means of these weapons only" (Chapter I, Sec. 31). Maybe it is the influence of Small Arms Schools and the stress laid on the annual Weapon Training Course, which still further accentuates the importance of percentages. So, perhaps, the minds of the less thoughtful of us become filled with visions of soldiers thrusting and parrying, lying and kneeling and squatting in all attitudes of the aiming position, of barrack squares littered with rifle rests, dummy sacks, and figure targets. Accordingly we can be misled into forgetting that the actual prodding of the enemy in the stomach, or shooting him from the shorter ranges, are—apart from the element of courage—only two of the many items of expertness involved during the long period of transit, through which the soldier, plus rifle and bayonet, must pass, from his arrival in a theatre of operations until the moment that he accounts for an opponent at the desired short range. We are thus apt to overlook completely the innumerable essential and increasing details of *individual* tactics required of the private soldier in order to fit him for his destiny in scientific war of the future.

[1] This was stressed in the article of August, 1928.

It seems, therefore, that we need to introduce new ideas, devise new methods of training, and consequently create a fresh impulse in the individual officer to introduce novelty and new ideas into his work. As things now are we wonder how many individual mentalities are not prepared to accept the old slogan of the " Section Stalk "—twenty years old now—as the last word in the tactical training of the section ?

Yet a further misconception—drill. Is there not still a tendency to assign a false value to drill ? Else why the renewed inclusion of " Battle Drill " in the text books ? The true inception of " drill manœuvre," that is, a battalion moving in square, or other rigid formation, was due to the genius of Gustavus Adolphus. It then constituted a very definite element of tactics. But after the lessons of the Franco-Prussian War of 1870, reinforced by those of the South African War of 1899 - 1902, it passed out for all time. Therefore drill to-day has become mainly an element of discipline ; and, if regarded as such, takes its true place in individual and collective tactics.

IV.

Based, then, to a great extent on these considerations, during our experimental training the following list of suggested items was drawn up and the soldier's training apportioned accordingly. The table was further divided into sub-headings with a rough ratio of potential values in percentages as a general guide to working out exercises to practice the soldier in each item. The resulting table was the following :—

Ratio by percentage	*Type*	*Heading*	*Description*
20%	A	Scouting	Nullah and river crossings. Enemy locations. Enemy sniping posts. Water holes. Prospecting camp sites. Observations on enemy activity. Ability to utilise map or sketch map, use of cover. Judging distance, etc.
15%	B	Lewis gun	Tactical handling in Attack, Defence, etc.
10%	C	Patrolling	Listening posts, connecting patrols, activity in No Man's Land, etc.
10%	D	Runners	Taking MS. by night to other H.Qs. after being in position by day. Guides, verbal messages, etc.
5%	E	Sentries	Outposts by day and by night, duties.
5%	F	Discipline	Company, Platoon, Section drill, Barrack inspection, etc
5%	G	Skill at Arms	Bayonet fencing, boxing, physical training, etc.
10%	H	Weapons	Firing practice, in the Lewis Gun, Rifle, Machine Gun. Air pistol and Revolver, by day and night etc.
5%	I	Technical	Wiring, Sniping, Physical fitness, Semaphore, etc.
10 to 20%	J	Marching	To and from Training Areas.
	K	Sand Model	Tactics.

This list, though far from complete, is fairly comprehensive, and gives a true indication of what a soldier now has to learn. To simplify matters further a period of twenty-five working days of four hours each, as in the officers' class, was fixed, giving thereby a total of a hundred working hours. This time was divided among the necessary exercises, according to the matter or lesson being taught. The resulting time allotted to each being a half-hour, an hour, or whole period, according as the work was done indoors, in the barrack area, or outside the barrack area. Each feature of exercise was allotted a series of block numbers.

V.

The production of such a programme of work, as well as the manner of carrying it out, may at first sight appear complicated, but is in reality quite simple. The following is a specimen of a weekly programme devised for a platoon :—

PROGRAMME OF WORK FOR No. 2 PLATOON "A" COMPANY.

Time	MONDAY				TUESDAY				WEDNESDAY				FRIDAY				SATURDAY			
	5	6	7	8	5	6	7	8	5	6	7	8	5	6	7	8	5	6	7	8
0615	CD				B	PT	PT	PT	PT	B	PT	PT	PT	PT	B	PT	PT	PT	PT	B
0645	CD					B	B	B	B		B	B	B	B		B	B	B	B	
0715	Breakfast																			
0745					Exercise 105	Leave Bks.			1	Exercise 105	5	4	Leave	Exercise 105	Bks.		Kit Inspection			Exercise 105
0815	Leave Bks.					41	42	43					43	42		41	7	8	9	
0845	41	42	43	44					4		1	5								
0915						61	62	61					61	62		62	9	7	8	
0945	Return Bks.				Return Bks.				22		22	22	Return Bks.							
1015	Break				Break.				Break.				Break.				Break.			
1045	91	92	91	92	91	92	91		Sand Table				91	92		92	98	97	91	
1115	92	91	92	91	95	99	99						95	99		95	97	98	97	
Remarks									Sand Table Ex. Pln. Comds.											

NOTES.—B—Breakfast. CD—Company Drill. PD—Platoon Drill. SD—Section Drill. PT—Physical Training.

It was found that, by starting two platoons one day ahead of the other two, the same weekly programme could be used by all four platoons without any undue clash in the matter of material required for the day's exercises, and without reproduction of the exercises other than in duplicate. By this means actually only five weekly programmes have to be worked out.

In explanation of the programme, if No. 6 Section on the second day be taken, the indication of its morning's work is as follows :—

0615—0645	Physical Training on Barrack Square.
0645—0745	Breakfast and tidy up.
0745—0815	Half hour to reach Starting Point in Training Area.
0815—0915	Ex. 41 (Enemy Location Ex.).
0915—0945	Ex. 61 (Guides Ex.).
0945—1015	Half hour to return to Barracks.
1015—1045	Break.
1045—1115	Ex. 91 (Loading ammunition on mule).
1115—1145	Ex. 95 (Loading blankets on mule).

The exercises themselves were written or typed on cards, and allotted a serial number according to the subject, place, and time period. They were made out, too, in " cadre " form, that is to say, by giving the frame work and omitting actual details or incidents, it would be possible to use the cards at any future time or on any ground. In addition, full details of materials, etc., required for the exercises were noted down in detail. A specimen exercise is given below, as well as a suggested form of test exercise :—

EXERCISE No. 27. (½ HOUR).

LEWIS GUN.—Selection of gun position in attack.

EXERCISE.—Men will work in pairs, representing Nos. 1 and 2. Each pair will be given the same piece of ground in which to select the best position for the gun (tactically) in the attack.

Each man in turn will represent both No. 1 and No. 2.

INSTRUCTIONS FOR SECTION COMMANDER.—Indicate to each pair in turn by means of small scheme :—

(*a*) Enemy action.
(*b*) Our own action.
(*c*) Limited area of from 50x to 100x square for choice of gun position.
(*d*) Gun to be able to fire enfilade or direct to front.

No. 2 will scout for gun position. No. 1 will bring gun into action on signal.

Take time from word " go."

Discuss best position and demonstrate.

KIT REQUIRED.—1 Lewis Gun ; 2 drums in carrier.

SECTION TEST No. 3.

1 SECTION IN FULL MARCHING ORDER WITH GREATCOATS.

(*a*)	Pitching a tent	Carried out by entire Section. Judged by time and style.
(*b*)	Striking and packing tent	By Section.
(*c*)	Assembling harness and harness mules ..	2 men.
(*d*)	Rolling blankets in mule load	2 men.
(*e*)	Rolling greatcoats in mule load in dark..	2 men.

METHOD.—Section will be supposed to be asleep in tent, jackets, boots and puttees equipment and rifles on ground beside each man, greatcoat worn. On word " Go " Section will carry out (*b*), (*c*), (*d*) and (*e*). Time will be taken from word " Go " till mule is loaded with roll of blankets and greatcoats, and Section is fallen in at attention ready to move off.

KIT REQUIRED.—(*a*) (*b*) 1 Tent.
(*c*) 1 Mule with complete pack saddlery.
(*d*) 8 Blankets and cord.
(*e*) 8 greatcoats and cord.
Stop watch.
Darkened room for (*e*).

At first sight the scope of the ground to be covered, let alone the compilation of the programme, might be apt to fill the uninitiated with misgiving: in real practice there is no great difficulty. The actual devising of the exercises is really easy. It is but necessary to recall mistakes committed during previous training seasons, to tasks and duties which it seemed hopeless to expect N.C.O.s or men to perform—solely because a correct method of work had never been properly taught. With a situation thus memorized, and the recollection of past faults or failures, the production of a simple exercise should be a matter of comparative ease. Moreover, it is remarkable how, eventually, during training, the least display of ignorance or lack of practice will instinctively suggest itself as the basis for a further little exercise for the tactical training of the individual.

The production of the first series of exercises, that is to say sufficient for a period of a hundred working hours, must naturally take time. But it is more than probable that no two persons will produce exactly the same exercise, so that an inter-change of exercises quickly helps towards the production of an ample syllabus. The final selection of exercises, based on some form of ratio of percentages, as suggested in Para. IV, should be easy. The compilation of the accepted programme thus becomes perfectly simple. Once a good stock of exercises is available, any organization of a morning's work, or even for a couple of spare hours, or for a definite period of training, becomes child's play.

VI.

Now, there exist, so far as the individual training of the man is concerned, two schools of thought. The first says: " You must never put advanced and backward men in the same squad." The second says: " You must let a commander train his own men." Both doctrines are fundamentally sound. Therefore one would like to accept them both. It is practically impossible to combine them under present methods. But, without necessarily combining them, it is maintained that, in the method of training here suggested, the principles underlying each are definitely maintained, in that every exercise, by increasing or decreasing the time factor, by simplifying or making more difficult the data or material involved, enables the section or platoon commander, by utilizing these varying degrees of intensity, to carry out the training of his own men, and at the same time to " separate sheep from goats."

Lastly, it might be stated that the actual success of the method here outlined and the results gained have been considerably greater than the writer ever ventured to hope.

These results may be summarized as follows :—

(*a*) The definite handing over of responsibility for the individual training of the private soldier to the warrant officers and n.c.o.s was to them a matter of considerable gratification while it added greatly to their confidence and self-reliance ;

(*b*) It enlarged their power of imagination and initiative ;

(*c*) It involved intelligent direction and control, as required in the conduct, unsupervised and unaided, of the various exercises. Thus, through having to teach, it made them not only learn but also assimilate, thereby making them obviously better able to take part intelligently as junior leaders in collective or battle training ;

(*d*) The men seemed to take to the idea with remarkable rapidity, while they found not only interest but even some enjoyment in the various exercises—a very different outlook to that prevailing during the normal form of individual training. A small series of fairly comprehensive tests at the end of each period also indicated that a good initial degree of proficiency had already been attained.

Much of peace time training automatically " goes west " in war. Much that can be asked of a man, in the absence of bodily danger in peace, becomes a moral impossibility in war. But new ideas in peace time are essential to counteract stagnation. If they aim, moreover, at creating in the individual the power to think for himself, to use his own initiative, then, taking again the courage element for granted, that man becomes automatically a better fighting soldier. By this step one approaches another step further towards the production of that " super-soldier," whom the evolution of modern warfare will inevitably demand.

HOW TO STUDY FOR THE STAFF COLLEGE

By " CIX."

My Dear Richard,

I hear you have decided to sit for the Staff College, and I suppose about five or six hundred other people will be doing the same.

Since I myself left the College I have helped quite a number of fellows who have been sitting for the examination, and perhaps the impression I have formed might be of some help to you. I can give you a few ideas on how to work, and perhaps what is of more importance, how not to work.

I think that there is a good deal of wasted effort expended on the business, and I think it worth while considering carefully the factors which make for success—they ought to be fairly obvious.

On General Reading.—The first point, I think, is the acquisition of knowledge. Now, my impression is that most officers read what is necessary to get through their promotion examinations and, when that is accomplished, are inclined to do nothing more. They decide later to sit for the Staff College and arrange to " commence work " on a certain date. Books, paper and maps are acquired and there is a great to-do. Herein lies the initial error. This attitude of mind pre-supposes that the necessary knowledge can easily be absorbed within a limited period. This, I think, is wrong. It seems to me that if you are prepared to start a general course of reading spread over a few years it is going to pay you hand over fist in the long run. I don't mean that you should start intensive work years before your examination commences, but that you should quite gradually and quietly read over those works which are likely to be of use to you, although their immediate value may not be apparent.

To particularize a little. Some of the books which have been published recently which are well worth reading include :—

" The Future of the German Empire " (Von Seeckt).
" Sherman " (Liddell Hart).
" Grant " (J. F. C. Fuller).
" The Endless Adventure " (F. S. Oliver).
" British Strategy " (F. Maurice).

I know some of them are " outside the syllabus " but still I recommend them. Although you are'nt sitting for a couple of years, I think you ought to read them. You won't retain more than perhaps five per cent. of the subject matter, but if you have read them well (a point about which I shall have something to say later) that five per cent. (or less if you like) is going to matter a great deal.

I need hardly say that the consistent reading of a good newspaper, e.g., *The Times* or *The Telegraph*, is essential. You must keep up to date with world events and world thought, and the reports of the debates in Parliament are perhaps the best means of doing this. Moreover, don't confine your reading to what are " likely questions," aim at being widely read.

I think too you should get into the habit of reading the Service journals—the R.U.S.I. JOURNAL, the " Army Quarterly " and " Fighting Forces "—this will keep you in touch with modern military thought. You will also find some excellent reading in the " Round Table."

Don't misunderstand me. I am not suggesting that you should start heavy and serious work years ahead, so that life becomes a positive burden to you. I merely suggest that you should read a proportion of serious books in your spare time, without making an onerous business of it.

If you are prepared to do this, I think you will find that when you start to do your more intensive work, instead of approaching it " like an idiot boy with an open mind," you will already have done a great deal of spade work—more than you realize. And this is what most people seem to lack. So often have I found officers who have acquired a detailed knowledge of certain subjects, e.g. the number of bicycles on war establishment of an infantry battalion or the number of cubic feet a soldier can dig in an hour, but who are quite lacking in knowledge of subjects of *general* interest. It seems odd, but the explanation is simple —they have confined their reading to " likely questions "—in other words, they have been " cramming," and when confronted by the unexpected, or a question from an unusual angle, they are unable to call on any reserve of knowledge or ideas.

Perhaps all this sounds like a diatribe against cramming, and I suppose it is. But perhaps you will agree with me that the man who is widely read and with broad interests, in other words a man with some intellectual background, has fifty yards start in a hundred over a man who dips into books collecting bits of knowledge, pulling them out and swallowing them—rather like picking out winkles with a pin! Moreover, if you read on these lines you are a better all-round man and

better equipped if you decide to leave the Service, whereas the hours spent at cramming are hours thrown down the drain.

On How to Read.—May I say a word on *how* to read? The mere acquisition of knowledge, in itself, is not difficult. It simply requires time and industry, and is, therefore, within the capacity of all. But you must get into the habit of reading intelligently. This, as I understand it, consists of accepting nothing you read. You should mentally reject everything you read (or hear) until you are satisfied in the light of your own judgment that it is sound. This may sound a trifle presumptuous, perhaps it is; but I believe it is the only road to truth in military subjects, or in life generally.

Can I give you an illustration of what I mean? Colonel Henderson's "Stonewall Jackson" is generally regarded as a military classic. But can you accept all his judgments? Is it not advisable to ask yourself a few questions, such as: Was Henderson biased against the North? Was his judgment rather obscured by hero-worship? Did Jackson have that wonderful foresight credited to him? Are Henderson's judgments on the politicians reasonable? Did he understand Lincoln's political difficulties? Is he inclined to be parochial in his outlook? Has he a proper conception of the modern relations of policy and strategy? You can, of course, say this or that is the case because Henderson (or anyone else) says so—you can accept blindly what you read. I would advise you, however, only to accept facts and to argue with opinions. It will repay you in an examination if you are able to think on reasonably sound lines; if you can't, then you don't deserve to pass.

You won't, I hope, go to the other extreme and disagree with everything you read—merely because the other fellow said it. He has probably very good reasons, and it is into this you want to enquire—try to get at the back of his mind.

Similarly, in reading books by people concerned with events they narrate, you want to know to what extent they constitute special pleading: you must note the political opinions of newspapers and their consequent bias.

What all this really amounts to is the old dictum of "read a little and think a lot."

I once asked a man who admitted to having corrected thousands of examination papers what he gave most marks for, and he replied "The expression of personality on paper." I think most examiners, consciously or unconsciously, do the same.

It is very refreshing to read the views of a man who has ideas of his own (even if you don't agree with them) as opposed to an indifferent

re-hash of the prosaic statements of some dull text book or crammers' notes.

On Intensive Work.—Let us suppose you have read on these lines for a few years and that you have decided to have a shot next year, and that you are going to begin work in earnest.

A good deal of donkey work has to be done, and only you can decide how much time you are going to give to it. But remember this. There are many people with a good deal of ability and a good deal of knowledge sitting for this examination. Perhaps the exceptional man need do little work and still pass in; most of us, however, are only average, and most of us have to work hard.

Are you properly acquainted with the principle of war (I think it still is one) called "concentration"? You will find it ignored by a number of people who are hardy annuals at the Staff College Examinations. They do some work, but not really seriously, because they are not prepared to give up the calls of social life. In the end, of course, a man of this description puts in many more hours work than the one who really gets down to it and gets in at the first shot. We most of us want things in life both ways, but we usually have to make a choice and unless you are really prepared to work it is far better to give up the idea of taking the examination.

My own view is that one should start work about May and gradually increase the number of hours per week. I would suggest, too, working to a programme, i.e. allotting so many hours a week to each subject. You may be inclined to spend more time on those subjects that you like best—or the reverse. But if you keep to a programme you will at least know what you are doing, and what you have done, and you can re-adjust it as necessary.

May I say a word about concentration in another sense? If you have not been accustomed to private study you will find it difficult at first. Your mind will wander, and if it is late in the evening well, you may find it still harder! Don't attempt too much at first. Take it in small doses, and don't go on wasting time, i.e. putting in time which isn't returning proportionate value. When you find you are reading and taking nothing in, pull yourself together and start again. If that doesn't bring concentration, then stop.

On "giving tongue."—I suppose there is very little to choose between 50 per cent. of the candidates in so far as knowledge is concerned. And yet inside that percentage you will find a very great difference in the marks awarded. This is because one man will get 100 per cent. value out of the knowledge he possesses and another probably not more than

25 per cent. It resolves itself into a question of " giving tongue on paper," and I have little doubt that this is the process mainly responsible for sorting out the sheep from the goats.

Your problem here is really two-fold: (*a*) to express yourself well, and (*b*) to do so in the given time.

I think that, in helping people sitting for this examination, I have found more weakness in expression on paper than in any other aspect. Officers with quite a fair knowledge of the subject on hand seem to be quite incapable of expressing themselves clearly. And the great majority give in. " I am very bad on paper " (i.e. " God was unkind to me") is the attitude, as though there is simply nothing more to be said—or done. It is quite true that some people have a natural facility for writing; but it is equally true that those who haven't can, with practice, attain a very good standard.

If you read good English you have gone a long way towards acquiring a good style. A study of Bacon's essays, for instance, will show you how much " meat " can be compressed into a sentence.

You will find that in most problems there are a few main points, more secondary ones, and numerous details. Think them over carefully and jot down the essentials before you commence to answer the question and make the really important ones stand out. You then have some hope of making the best of your knowledge.

But if you want to get into the habit of writing you must practice, and do so consistently. Most people spend hours and hours on reading and hardly any time in writing—and then complain they are " bad on paper." I would recommend you to write something, however short, every day you read.

Try to get a picture of the examiner. He has hundreds of papers to correct, he is working many hours a day, usually late at night, his time is very limited and you must be prepared to humour him. He knows the essentials of every problem, for he has already worked out all that can reasonably be said. He wants to find out what you, as an individual, think about things, and above all without any unnecessary or irrelevant chat. Do you think it would be a good idea, when you practice answering questions, to go through your work with a red pencil and knock out any unnecessary words or any phrases which could be shortened?

How often does one hear " I couldn't get it done in the time "—usually put forth as a grouse? Most people who complain that it is quite impossible to complete the paper in time fail to realize that they are not competing against an arbitrary standard, but against the man

sitting in the next chair. Whether everything relevant on the subject can be written within the time allowed matters little; the marks go to the man who can write the most. After all, if there was no time limit, there would be little to choose between the work of the candidates.

But how many people practice writing against time, and what proportion of their hours of study do they devote to it? I suggest to you that you should frequently (and towards the end of your period of study, daily) lock your door, take out your watch and say "I will answer a question against time." Select a question from papers already set, allowing yourself the time allowed in the examination, *and not one minute more*, and see what you can do with it. You will soon use up old papers, and you should therefore get someone to set you some "forty minute questions"—the more searching they are the better. Even if you find you know little of the subject of the question it matters little—make the best of what you do know (you can read it up later) and, after all, this is a situation which may well confront you in an examination. You can't have too much practice on these lines. I have known a number of candidates who have worked on this system. In most cases their early efforts were bad, some were really incredibly bad, but in the course of time the improvement was quite surprising.

On Comments.—Your chief difficulty will be, I imagine, in getting someone to make constructive comments on your work, and this I think is the chief reason of the continued popularity of crammers. There may be officers in your regiment able and willing to help; you may be able to get some staff officer with the benefit of a Staff College education to look over your work. But almost any sensible person will be able to give you a good opinion on non-technical subjects. They can say, for example, if you have answered the question, if it is arranged in proper sequence, if you have been verbose, if you have been convincing. In this respect I can assure you that some women are often very good critics; they bring a fresh mind to bear on the subject, and their comments are often very much to the point.

It is late and I must stop.

COURT-MARTIAL PROCEDURE
A REPLY

By MAJOR H. MEREDITH LOGAN, The Royal Canadian Regiment.

IN the last number of the JOURNAL, there appeared a very interesting article upon "Court-Martial Procedure."[1] It was "A Suggestion," and although we cannot agree with the innovations advocated, nevertheless it inspired thought upon a subject which receives far too little attention to-day.

The mutiny of an infantry regiment in 1689, which extracted from a terrified Parliament the first Mutiny Act, was but a later development filling a gap in an already existing system of military government. This totally inadequate statute of ten sections grew to the present Army Act, including in its progress the Articles of War, whilst court-martial procedure at last took written form. The progress of the whole, culminating in the splendid completeness of the "Manual of Military Law," was guided by vast experience and the labours of many brilliant brains within and without the Service. Hence although the "Manual" is the product of man, and cannot therefore be infallible, any suggested changes must be subjected to an exacting scrutiny before they may even pretend to qualify for insertion in the most outstanding textbook which we possess.

The importance of discipline in the attainment of success in war requires no stressing. Hannibal owed no less to it than did Cromwell, Frederick or Wellington. It will be found only in an army which is governed by a systematic and just code, suited to the times and the race, and ably administered through a thorough knowledge of that law. "The object of military law is to produce prompt and entire obedience," observed Sir Charles Napier. One of the objects of the Army Act is ". . . to provide for the maintenance of discipline among the troops," to which the words of Lord Wolseley should be added, "For perfect discipline the men must have no just grounds for complaint" But certain it is that the object of military law has not been attained, and men do have just cause for complaint when ". . . obviously guilty

[1] See p. 370, R.U.S.I. JOURNAL, May, 1930. "Court-Martial Procedure: A Suggestion." By Captain F. C. Curtis, Royal Signals.

men have been known to elude conviction on account of some pure technicality." Military law, however, if adhered to, appears to allow for no such possibility.

We may consider a man as "obviously guilty" only when the evidence shows that such is the case, for ". . . every man is presumed to be innocent until he is proved to be guilty." Now should a technical defect in procedure be found which does not affect the real merits of the case, Rule of Procedure 56 exists to prevent a miscarriage of justice. In the event of certain other technical faults existing, Rule of Procedure 55 allows the confirming authority to correct these errors. Other cases are dealt with by the withholding of confirmation, thereby rendering the accused subject to re-trial. But although re-trial should be resorted to ". . . only when the needs of discipline and justice demand that an offender shall not escape punishment on account of a legal technicality," still if the accused is "obviously guilty" then the "needs of discipline and justice" certainly require such action.

It is perfectly true that for certain reasons, such as where a court has improperly admitted evidence, the proceedings may be quashed after confirmation, and the man is not then subject to re-trial. This is not, however, due to any unwarranted leniency in the law, but to the fact that someone has blundered.

"The main complaint against the present procedure," made by Captain Curtis, "is that trials last an unconscionably long time." As an illustration, he states that a magistrate would dispose of a simple case of petty theft in half-an-hour, when the same offence before a court-martial may ". . . occupy the time of five commissioned officers for a whole working day." The objection is understandable in an age when speed is a new god to be worshipped by all and sundry. That it is a sound objection is another matter to be considered. The illustration is, however, scarcely apt, for theft in civil life cannot be quoted as a parallel to the same offence in the army. If the theft is from a civilian it is probable that a magistrate will dispose of the case in a manner suitable to the most fanatical amongst the disciples of haste. If the theft is from a person subject to military law it usually will be from a comrade, and the "Manual" considers such as "peculiarly disgraceful" owing to the conditions under which the soldier lives.

Times have changed and so has court-martial procedure. One wonders if over a hundred years ago officers complained of the undue length of courts-martial, yet they would appear to have had just cause to do so. Lieutenant-Colonel Andrew Dennis O'Kelly of the Westminster Regiment of Middlesex Militia was tried by general court-martial at the Horse Guards, and some unfortunate officer, acting as judge-advocate,

was thus compelled to write evidence from the 16th of February until the 11th of March, 1796. Major Robert William Ottley of the 85th Regiment of Foot was tried by general court-martial at Sunning-Hill Wells, the trial lasting from the 13th of August until the 16th of October, 1800. The probably better known court-martial upon Lieutenant-General John Whitelocke, at the Royal Hospital at Chelsea, lasted from the 28th of January until the 18th of March, 1808. Short courts-martial in those days were the exception rather than the rule. This was largely due to the complicated charges, and to the verbosity displayed in the opinions and sentences of the courts. Colonel John Fenton Cawthorne of the Westminster Regiment of Middlesex Militia was tried at the Horse Guards in 1795 upon fourteen charges which totalled 2,783 words. The opinion, which corresponded to the present finding, was a small essay of 2,498 words. Hence before we complain we should compare, and realize that modern procedure, provided the court is correctly carried on, has reached a reasonable minimum of duration.

As a premise to the "Suggestion," the present undue delay in procedure is mainly attributed to the snail-like speed with which the president records in his own handwriting, ". . . a pretty full statement of the evidence." But perhaps the connection of Rule of Procedure 43 with this has been overlooked—"The court will deliberate on their finding." Also a paragraph from Tytler's "Essay on Military Law," written over a hundred years ago, contains so much that should be applied to-day, that it deserves quotation. "It is likewise a material advantage of the trial by court-martial, that the whole evidence is accurately taken down in writing in presence of the members of the court, who may at all times resort to the written proceedings, which in the close of the trial, and before sentence, are commonly read over to them, and compared with and corrected by their own notes taken during the trial; so that every one of the jurors must be completely master of the whole body of the evidence." The correction of the proceedings is of course not applicable, but in each case it is realized that time is required for a consideration of the evidence if a just decision is to be given, and the high reputation for fairness maintained by courts-martial. The initiation of the deliberation by the president, and its general conduct, will be greatly facilitated if the court has had an opportunity to weigh the evidence while it is being written. But if the speed of recording is increased, so too will there be an increase in the length of the deliberation.

"Many witnesses are quite unable to give their evidence in the form in which a lawyer would like to see it written down." But are the witnesses before a court-martial less intelligent than those so often seen

in a civil court? And admitting, as one must, that very many courts-martial are unduly long, we find here the first and foremost cause for the delay. How many barristers would receive briefs were they to conduct their cases with as little preparation as do some officers?

Rule of Procedure 83 (A) directs that "Every question will be put to a witness orally by the prosecutor, by or on behalf of accused . . . and the witness will forthwith reply." The "Manual" likewise rules that the examination of witnesses for the prosecution will be conducted by the prosecutor, whilst that for the defence will be carried on by the defending officer, if one has been appointed. But if the prosecutor and the defending officer would prevent undue delay by the elimination of discursiveness and the cutting of evidence to essentials, they should previously prepare a series of questions which ". . . must be relevant to the issue," and to which concise and definite answers can be given by the average imperfect witness.

Captain Curtis tells us that in the case of the majority of witnesses ". . . it is definitely not a practical proposition for even the most long-suffering President to record in full 'the words used.'" Hence it is necessary to make a précis of the evidence, and précis-writing is a difficult art. Yet for at least the last century and a half presidents and judge-advocates have been recording evidence fully, finding no necessity for the writing of précis. Tytler stated that in his time evidence should be taken down either by question and answer or in narrative form, but in the latter case the recorder was directed to adhere ". . . as nearly as possible to the very words of the witness." Rule of Procedure 95 (A) shows that time has not altered this ruling. It is, therefore, the contention of the present writer, that if prosecutors and defending officers will spend time in the preparation, and exercise thought in the framing, of questions, the difficulties seen in the recording of evidence will be almost non-existent. Much responsibility, too, falls upon the court in regard to the evidence, but if all who take part in the proceedings do their work as it should be done, then the recording officer deserves little pity, for he is merely doing his duty in the interests of justice "for a whole working day." To attempt to make a précis of evidence will usually prove unfair to all concerned, the confirming officer included, whilst it is certainly not adhering to either the spirit or the letter of the law.

Captain Curtis has pointed out that the evidence may be written by a junior member, and it is agreed that this is very often preferable. It is frequently done in Canada. But better by far would be the introduction of a judge-advocate for all courts-martial.

It is suggested that all evidence for the prosecution should be written by the prosecutor whilst that for the defence should be written

by the defending officer. The advantages claimed for this innovation cannot be conceded, but are worthy of consideration.

There is first the idea that " Each side would be sure that the points of evidence which it regarded as essential were clearly expressed in the record." Yet they may equally be sure of it under present procedure, and it cannot be assumed that a prosecutor or a defending officer, by virtue of his appointment, suddenly becomes gifted in the art of clear expression.

The second advantage claimed is that, as the prosecutor and the defending officer have a previous knowledge of the facts of the case, they could omit evidence which the president might not be prepared to do, and thus " The record could be more brief." But from the point of view of the prosecution, at any rate, the president has a previous knowledge of the case since he has a copy of the summary of evidence. Furthermore it is the present prerogative of both sides to eliminate unnecessary evidence before it is given, which they will do if they properly prepare the case. Once the evidence is given, however, it is for the court to decide whether or not it shall be recorded, and even in the quest of speed the duties of the court must not be usurped.

Finally, " The slightly more active part in the proceedings, which would fall to the Prosecutor and the Defending Officer, would be good training for these officers who, in the natural course of events may be expected to preside over Courts at a later stage of their career." The more active part which they would take is undoubted—indeed it would be too active. But if presidents of the future are not to record proceedings, wherein may be derived the advantageous training from spasmodic efforts in penmanship?

THE PRESENT POSITION IN EGYPT

By Major E. W. Polson Newman, B.A., F.R.G.S.

WHEN it is considered that parliamentary government in Egypt has been brought to a complete standstill on not less than three occasions in its short life of nine years: in 1924, after the murder of the Sirdar; in 1928 after the death of Zaghlul, and only three months after the election of Nahas as Prime Minister; then again in 1930, when Sidky formed the present Government, it is not surprising that it has not succeeded. Its longest period of life was from 1925 to 1928, and this was only due to the presence in Parliament at that time of a good number of non-Zaghlulists and the formation of a coalition government under Adly Pasha, and later under Sarwat Pasha. The Cabinet was composed partly of Zaghlulists and partly of Liberal-Constitutionalists, the latter of which formed the most competent element. But the actual reason for the failure of the constitutional system in Egypt lies in the fact that one political party has always emerged from the elections with a very large majority; and that this party has been entirely free of parliamentary criticism, although it has made the greatest blunders imaginable. These blunders were fully appreciated by all true patriots and thinking politicians who had the interests of the country at heart, but they never came to the knowledge of the vast and ignorant electorate which put this party in power and thereafter enjoyed complete political oblivion. The best elements in Egypt did not want the Wafd to continue either the policy they were pursuing, or the system which kept them in power, as the latter had been taking advantage of the fact that the great majority of their constituents did not understand the shortcomings of their policy and relied for their information solely on Wafdist propaganda. The ignorant masses concentrated their attention on the futile promises of complete independence, complete withdrawal of the British Army, and the inclusion of the Sudan as an integral part of Egypt, and were raised to a high pitch of national enthusiasm on this foreign issue, at a time when Egyptian policy should have been concentrated on domestic affairs. This has been responsible for the large Wafd majorities and has been the result of granting a constitution to Egypt before the final Anglo-Egyptian

settlement had been concluded. Obviously, it is useless to continue a parliamentary system which has definitely failed, and defects must be rectified if it is intended that constitutional government should continue in Egypt. This, however, is a task, not for the British Government but for the Egyptian Government; and Sidky Pasha, as a constitutionalist, a leading member of the Commission which drew up the present Constitution, and a member of the Ministry which secured constitutional Government for Egypt in 1922, has only introduced such changes as do not infringe constitutional principles.

While the changes introduced by the present Egyptian Government are moderate in nature, they have been designed to increase the representation of the more responsible elements of the population while at the same time safeguarding the principle of universal manhood suffrage. Among the principal changes made by Sidky Pasha are a return to the former two degree electoral system introduced in 1922; the raising of political maturity from 21 to 25 years; the proportion of nominated Senators increased from two-fifths to three-fifths; the decrease of the total number of Senators to 100 and of Deputies to 150, in order to raise the standard of these legislative bodies; and the responsiblity of Ministers to the elected Chamber, which cannot defeat the Ministry except by an absolute majority. It is hoped that these constitutional and electoral reforms will go far to eliminate the objectional system by which the Wafd has striven to maintain themselves in power, which is the sole object of Wafdist political endeavour. In this system Anglo-Egyptian negotiations have played a very important part, and have been fully exploited by this party for the furtherance of political, and even of personal, interests. Since 1920, the British Government have negotiated with the Egyptian Government on not less than six occasions in their endeavour to reach an understanding between the two countries, and on each occasion their efforts have been unsuccessful. On three occasions Egypt was represented by the Wafd, and on two other occasions non-Wafdist negotiations were wrecked in Cairo by this party. These negotiations have had the effect of creating in Egypt a competition for political power, based on the terms which each party was willing to offer or accept, and it was only natural that the party making the greatest demands on the British Government should make the greatest appeal to the electorate. Thus, in order to gain and secure the confidence of the ignorant Egyptian majority, the Wafd pursued a policy of savage attacks on Great Britain combined with exaggerated demands. Those, on the other hand, who adhered to the original demands of Zaghlul Pasha in 1920 and believed in cultivating friendship and confidence in Great Britain in order to obtain a peaceful settlement, were violently attacked by the Wafd, and in some cases even murdered. Now the

strange sequel of this is that, at the very time when Anglo-Egyptian relations were uppermost in the minds of everyone in Egypt, and the Wafd continuously held a large majority in the country, the British Government proceeded to grant Egypt a modern constitution with universal manhood suffrage. Whereas the granting of the constitution should have been the natural outcome of an Anglo-Egyptian settlement, this inopportune step was taken in circumstances which have led to the most unfortunate consequences.

These consequences are that, if the British Government insists on negotiating with an Egyptian Government with a representative majority, they are at present practically compelled to confine their negotiations to the Wafd and to ignore the more moderate elements in Egypt, who are honestly working for a just and lasting agreement and for this very reason lost their majority in the country. Further, as result of a policy of making promises which they could not fulfil, the Wafd now find themselves in an impossible position for compromise; and it was this fact that led to the breakdown of the negotiations last spring between Mr. Henderson and Nahas Pasha. Indeed, it is difficult to see how in these circumstances it will be possible for the Wafd to conclude any future settlement.

At present there is a complete lull in Anglo-Egyptian affairs owing to the constitutional crisis in Egypt and the urgency of other internal affairs with which the Egyptian Government is fully occupied, but it seems as if the present situation presents two alternatives :—(*a*) constitutional and electoral reform in order to ensure the representation of the saner elements of the Egyptian population, and no further negotiations till this new experiment has proved to be a success—or (*b*) an agreement between the leaders of all political parties in Great Britain that the terms offered by Mr. Henderson to Nahas Pasha last spring will stand in future as the absolute limit to which this country is prepared to go; and that the British Government will sign an agreement on this basis with whatever Egyptian Government can in future obtain the consent of the representatives of the Egyptian people to these proposals. The latter alternative would eliminate all future negotiations and any further political competition between parties in Egypt on the treaty issue.

As far as the constitutional and electoral reforms are concerned, the British Government have no right to interfere in a question which is essentially an internal affair of Egypt, unless there should arise a situation affecting the Four Reserved Points. It is here that the British Government may be faced with a difficult position. Although at present there is no reason to anticipate anything but calm in Egypt for some little time, it seems more than probable that the Wafd will sooner or

later resume their old games in their efforts to regain power. In such circumstances neutrality is the only policy for the British Government. On the last occasion when Nahas Pasha stirred up trouble in Zagazig, Bilbeis, Mansourah and Tantah, ending with the riots in Alexandria, the present Government in Cairo not only succeeded in restoring order by means of Egyptian troops and police, but even refrained from proclaiming martial law and from setting up any special tribunals. There is, therefore, every reason to hope that Sidky Pasha will have no difficulty in dealing with any future trouble on similar lines which may arise. But, should disturbances break out endangering the lives and property of foreigners in Egypt, full responsibility lies with the British Government. Although the British Government cannot take one side or the other in an internal quarrel between Egyptian political parties, they must be ready to support in case of necessity those elements of the Egyptian people that choose to further the maintenance of law and order.

TURKEY TO-DAY

By Lieutenant C. R. A. Swynnerton,
The North Staffordshire Regiment (The Prince of Wales's).[1]

EIGHT years have now passed since Turkey, by annihilating the invading Hellenic armies in Anatolia, substantiated her claim not only to the whole of Asia Minor but also to a tract of eastern Europe sufficiently large to justify her demand for recognition as a European state.

During these eight years the Turkish Republic, born amidst the confusion of war and within earshot of battle, has seen more reforms, constitutional, social, legal, educational and religious, than the Ottoman Empire had experienced in her five centuries of European existence. We occasionally come upon reforms under the absolutist Sultans, but none of these were so drastic in their execution or cut so deeply at the roots of the established order of life as do these more recent efforts to bring the Turkish nation to a level of equality with the states of western Europe.

It can be said with complete truth that a weaker man than Mustafa Kemal Pasha, or even a strong man who did not enjoy the supreme confidence of the people like the Ghazi does to-day, could never have accomplished so much or carried so bold a policy to success. Discontent has, indeed, on more than one occasion flamed up into armed revolt necessitating punitive operations, but these tendencies to run counter to the prescriptions of the Government are to be found only in the extreme East, where there are strong Kurdish and Arab elements. Even there, however, the policy of allowing the new doctrines to penetrate peacefully under gentle pressure appears to be bearing fruit, in spite of the present disturbances organized by discontented Kurds, whom the Turkish press designates as bandits.

The exchange of populations agreed to at the Treaty of Lausanne gave rise to considerable friction and ill-feeling between the two countries concerned, and it was not until the present year that misunderstandings were eliminated. Whether Turkey has gained by these exchanges and the wholesale deportation of Armenians is a debatable point. The

[1] The author of this article has lately returned from a nine months' course in Turkish, during which he stayed with a Turkish family and met and conversed with Turks of all grades of society.—Editor.

middleman of commerce, as personified in the Armenian and the Greek, is no longer to be found in Asia Minor to dispose of the peasants' produce, and as this middleman was generally a person of some substance, the absence of his comparative wealth is undoubtedly greatly felt, especially in the rich agricultural areas. Furthermore, the Greeks were pre-eminently the tobacco-growers and carpet-weavers of Anatolia, and it is a significant fact that the quality of Turkish tobacco has deteriorated and that the carpet industry is practically dead. On the other hand, the Turks argue with considerable justice that these elements made the most of their opportunities in peace to profit by the country, but in war were always in opposition to the power to whom their allegiance was due. Therefore this mass of internal and potential foes was ever a source of danger and weakness to the old Empire, and would have continued to be so to the Republic of to-day had not recourse been had to the expedients of exchange and deportation.

Unfortunately, in every case the incoming Turk was poorer than the outgoing Greek or Armenian, and this fact has contributed in no small degree to the present economic and financial crisis with which the Government is faced. Whether Turkey can continue to progress without the assistance of a foreign loan is doubtful, but her reluctance to make any such contract is justified to some extent, as loans in the past have usually been accompanied by a certain restriction of political freedom, and foreign influences at the present time are gravely distrusted. The materials for a flourishing state are at hand, but a foundation of solid financial security is lacking for the completion of the edifice.

The government, like that of so many other states of to-day, is a dictatorship with a strong military backing. The constitution prescribes for a President and an elected Grand National Assembly, but the members of the latter are not the choice of an electorate but nominees of the President. Thus there is no opposition party in the Assembly, and in fact there is only one party in the whole country—the People's Party. Such a system is, of course, open to grave criticism ; but it can be fairly argued that in the present tangled state of world politics in general, and having regard to the political ignorance of the mass of the population in particular, government by the more enlightened few is not only preferable but essential. Without a National Assembly so united as to fundamentals, no such internal policy as that of the last eight years could have been followed with the success that has attended its execution.

Whether it has been realized that such a form of government is not an unmixed blessing or whether it is considered that the time is now ripe for the appearance of a political opposition, we shall probably never know, but it has been reported of late that the Turkish ambassador to

Paris has been recalled to Angora to form another party in the Assembly. According to the Turkish press this party will enter the political arena with the object of securing the institution of polling, the abolition of the monopolies, the decrease of taxation (a heavy burden on the country, there as elsewhere), and, most important perhaps of all, the flotation of a foreign loan. Any conjecture as to the effect of this party's activities on the country's politics would be decidedly premature at the moment.

The substitution of European headgear for the fez and kalpak previously worn was only a step in the direction of Westernization. So long as the Turk wore a fez he considered himself and was regarded by the rest of the world as an Asiatic. Whatever the effect of this substitution may be on foreign countries, there is no doubt that it has made the Turk regard himself from a European standpoint, and has caused him to think more in terms of the West than of the East. The measure met with unpopularity, but seldom in history has any reform been greeted with unqualified approval. The peasantry regarded the new hat as cutting them off from Islam, and even as converting the wearer into a *giaour*—a term which incidentally is now forbidden. But time has cured this idea and the greater utility of European headgear has come to be recognised, although a few die-hards still wear their caps with the peak to the back as a gesture against European encroachment.

The educational and language reforms go hand in hand, and constitute, perhaps, the greatest forward steps that the country has taken under the progressive Ghazi. In the old days writing was the accomplishment of an educated minority, and was learnt with the expenditure of great labour. Much time was spent by the *hojas* on teaching their pupils the various complicated forms of the writing, from manuscript and ordinary print to the highly ornate style in use for religious signs. This with instruction from the Koran practically completed the amount of teaching allowed by the Sultans. Any further knowledge a youth wished to acquire had to be sought in secret, in constant fear of the spies of the palace and of a terrible retribution. In the days of Abdul Hamid spies were everywhere, and the right to free speech was not even a name. The most innocent conversations were liable to be carried to his ears and construed into a conspiracy directed against the State.

Education to-day, on the other hand, is as liberal as it can be under the circumstances. The old *medresses* accused of inculcating insidious doctrines have been abolished, and all towns and important villages boast primary and middle schools, either in operation or in course of construction. The new buildings are of stone and on modern lines, while the curriculum, which includes games, is comprehensive. Parents,

who at a mature age could read and write with difficulty if at all, are loud in praise of the introduction of Latin characters, and take great pride in the accomplishments of their children, who now read and write at an early age with ease. Night schools, which are held in winter for adults to learn the new characters and spelling, are meeting with an appreciable measure of success. Reading rooms equipped with literature in the new characters abound, and the authorities spare no pains in their efforts to eradicate the Arabic script.

A serious drawback to the new writing is that no shorthand exists, and this deficiency is keenly felt in the law courts and imposes great delay in hearing cases.

Legal procedure has been brought into line with the rest of Europe by the abandonment of the Islamic laws and the adaptation of the present Swiss code. The death penalty is now awarded only in cases of treason and murder accompanied with excessive brutality, and the divorce laws have been tightened up. Plurality is forbidden, and no longer can a man turn his wife adrift without notice by the simple repetition of a formula; both he and his wife must now take their appeals to court and abide by the decision of the judge. Marriage is no more a purely religious affair accompanied by traditional procedure; every union has to be registered before it becomes valid. The courts, too, have lost their old, and none too enviable, reputation, and the judicial system compares favourably with that of most countries.

The social reforms are undoubtedly the most difficult to enforce. Although the absence of the veil is practically complete in Constantinople, the women of the interior still like some form of covering for the face in the presence of a stranger. The reason, of course, is obvious. One might as well command the women of Great Britain to walk about naked, for uncovering the face to the older generation of Turkish women is tantamount to asking them to walk about in open shame. Here again the new education will take a hand in this, and one may safely prophesy that the rising generation will regard the veil much as the women of Western Europe regard the red flannel petticoat of yesterday.

However it cannot be claimed that the Turk is a fanatic. His co-religionists in Arabia, Persia and even India have much to learn from him on the subject of toleration. Furthermore, the Turk being amenable to discipline and by nature inclined to carry out the precepts of those in authority over him, there is more hope of real and immediate social progress in Turkey than there is in those other countries.

An element in assisting the progress of social reform is the *ojak*, an institution to be found in every town and large village, and which has for its object the breaking down of the old barriers between men

and women; barriers that have existed since the very foundation of Islam. The *ojak* is in reality no more than a club; games are organized and encouraged, and entertainments are fostered by the higher officials. Football enjoys a great popularity, and is indulged in from Adrianople to Diarbekr.

This progress of football is worthy of note in view of the fact that a Turkish friend of the writer was imprisoned in the days of Abdul Hamid for organizing a club in Kadiköy, the object of which was nothing but the introduction of the game! In those days of universal espionage this attempt was regarded as an organization directed against the State, and its members were forbidden to meet under dire penalties. After twenty-five days of restriction the founder was given a diplomatic post abroad; a strange proceeding but in keeping with the tactics of the Sultan, who thereby hoped to turn a suspected enemy into a friend, and at the same time ensured his remaining at a safe distance.

Boxing is another sport indulged in in Constantinople, and the standard is sufficiently high for a representative team of the visiting British squadron to have been defeated at the hands of the Galata Serai Club. The introduction of this sport into the interior is under contemplation.

Another feature of the *ojak* is the encouragement it gives to dancing; not national dancing but full-blooded fox-trots, waltzes and tangoes, as performed in the first towns of Europe. Here, however, the retarding influence of the harem tradition makes the path of the enterprising reformer no easy one, and it is difficult to get the women to participate. This prejudice is slowly being broken down by the army, the officers of which are an enlightened corps and have all had the opportunity of appreciating dancing in Constantinople and Angora. These bring their wives to the *ojak* dances in their station and thus, consciously or unconsciously, affect the outlook of the local inhabitants, who have had no opportunity of visiting those places where the Turk is more in contact with the foreigner.

A Women's Union exists to secure the recognition of such rights as it claims, and has lately been so far successful as to secure the election of women to posts on municipal bodies.

The Red Crescent Society, a counterpart of our own Red Cross organization, is active in giving entertainments, primarily for its own funds, but these functions all help towards the gradual westernization of the country.

To realize all these aims, however, money is more than ever necessary, and the absence of that medium is only too apparent. The railway

construction now being undertaken is a great drain on the national purse, and it is open to question whether the resulting economic benefits foreshadowed by their completion will justify their cost for many years to come. Much work must be done upon the roads before these can become adapted to the strain of modern transport, while road construction and maintenance are notoriously expensive.

Another feature of Republican Turkey, not without significance, is that all government offices, railways, tramways and ferry services are staffed entirely by Turks, whereas under the Imperial régime these posts were almost exclusively occupied by foreigners or Greeks and Armenians. Whatever may be said of the Turk as a business man, there can be no question but that these services are efficiently administered, and that a high standard of cleanliness is maintained in the coaches and saloons.

Turkish subjects may now travel freely to foreign countries; in common with some of the Balkan peoples they still talk about travelling "to Europe" if they intend going beyond the limits of old Serbia! Under Abdul Hamid they were not allowed to leave the country, and those who escaped were usually awarded a decoration by the Sultan on the previously-quoted principle of winning over an enemy. It is even stated that some with no quarrel with the Government of the day absconded from Turkey in order to secure the forthcoming honour!

With regard to Turkey's foreign policy it may be said that she genuinely desires to live at peace with the world and especially with her nearest neighbours. She wants nothing more than to be left alone to develop her internal policy and perfect her schemes of reform. Her present incursions into Persia are carried out solely to ensure peace upon her troubled eastern frontier, and are not inspired by any thoughts of conquest.

As it is less than a decade since Turkey reconstituted herself and embarked upon these reforms, she may still be regarded as being in a state of embryo. Up to the Great War she had made but little progress, except in the military sphere, and one may say that the condition of the interior was not very different from that of 1453, when Byzantium fell before Mohammed the Conqueror. If the revolution which lately displaced the Sultans was an event of great moment, the revolution of thought that has swept through the country since that event is of far greater import, and augurs well for future stability. Turkey has now aroused herself to shake off the slumber of centuries and, although confronted by tremendous economic obstacles, is making a great effort which cannot but compel appreciation, to bring her new-born life up to the standard of those nations who have advanced whilst she slept.

THE INTERNATIONAL SITUATION

THE RATIFICATION OF THE LONDON NAVAL TREATY

BRITISH EMPIRE

THE Ratifications of the London Naval Treaty were deposited at the Foreign Office on 27th October, on behalf of all His Majesty's Governments except that of the Irish Free State, whose Ratification is delayed for the moment by technical difficulties. The Ratifications for the United Kingdom, the Dominions and India, all bore the signatures of His Majesty The King. The formal ceremony of handing in the Ratifications was attended by the Prime Minister, the Prime Ministers of Canada, Australia, New Zealand, South Africa, and the High Commissioner for India, and the American and Japanese Ambassadors; the Ambassadors of France and Italy were also present.

In a broadcast speech, the Prime Minister said: "Now, for the first time in history, the three principal naval Powers will put into operation a system of limitation and reduction which will apply to all parts of their respective fleets to 1936. Thus for the period named, and, we fondly hope, for all time, the evils of naval rivalry have been eliminated between them. . . . The Treaty was also signed by France and Italy, but these two Powers are not yet parties to that section which limits naval strength."

In connection with this statement, it should be noted that although the French and Italian delegates *signed*, in company with those of the other three Powers, at the London Conference, the French and Italian Governments have not yet *ratified* the Treaty, and have not, therefore, committed the two countries even to those sections of the Treaty to which they are parties.

JAPAN

In spite of strong professional opposition to the Treaty, the Prime Minister of Japan presented it to the Emperor with a request signed by the whole Cabinet that he would ratify it. This he did on the 2nd October. It will be recalled that Admiral Kato, Chief of the Naval Staff, had previously resigned, as a protest against the Treaty; and after it was signed Admiral Takarabe, the Minister of Marine, also resigned, giving age and ill-health as his reasons. He has joined Admiral Kato as a Member of the Supreme War Council.

FRANCE AND ITALY

The Franco-Italian discussions on the subject of naval strength appear to have reached a deadlock. The eminently practical attitude of France is that the strength of her navy must be calculated on a basis of her " absolute requirements " as a Power with an extensive Colonial Empire, and not on that of a comparison with the naval strength of a purely Mediterranean Power.

Italy still seeks parity with France, and maintains that her peculiar geographical situation justifies this claim. It is evident, therefore, that until some middle ground is reached between the calls of " security " on the one hand and of " parity " on the other, an element of naval competition must continue to exist between these neighbouring Powers.

THE POST-TREATY SITUATION

That part—Part III—of the Treaty which governs limitations in all classes of warships on the part of the British Empire, the United States and Japan now becomes effective. The principal details were given in the JOURNAL for May, 1930. A clause in the Treaty which was omitted from that summary may prove to be of some importance. Article 17 of Part III states:—

> " A transfer not exceeding ten per cent. of the allowed total tonnage of the category or sub-category into which the transfer is to be made, shall be permitted between cruisers of sub-category ' B ' and destroyers."

This means, theoretically, that not more than 15,000 tons may be transferred from the total of 150,000 tons, which is the British Empire's quota for destroyers, and utilized to increase the number of our 6-inch cruisers. Or, on the other hand, not more than 19,220 tons may be deducted from the quota for those cruisers and utilized to increase the number of our destroyers. It would seem that this clause may enable us to add to our quota of destroyers at the expense of our cruisers; but the " 91,000 tons clause " limiting our cruiser construction overrides the transfer of destroyer tonnage to cruisers.

In view of the continued deadlock between France and Italy, the naval position in the Mediterranean is already giving rise to considerable anxiety. The rival nations whose navies, except in regard to capital ships and large aircraft carriers, are not restricted, have already been increased within the past few years to such an extent as to disturb seriously the balance of sea power in those waters; and the number of warships now building or projected, especially by Italy, is a factor which cannot but further aggravate the situation. Reviewing the

cruiser, destroyer, and submarine strength which we have available to-day in Home and Mediterranean waters, and that of the three principal European Powers on the flank of our sea route to the Far East, we find the position is as follows:—

	British strength in Home and Mediterranean Waters	*French strength in Channel and Mediterranean.*	*Italian strength in Mediterranean.*	*Spanish strength in Atlantic and Mediterranean.*
10,000-ton Cruisers.. ..	6	4	3	—
Smaller Cruisers	31	11	8	6
Flotilla Leaders	14	12	22	3
Destroyers	119	64	63	7
Submarines	44	51	42	15

Note.—Ships which are only cruising temporarily out of these waters are included in the above.

The French and Italian building programmes are also of importance:—

	France.		Italy.	
	Building.	*Projected.*	*Building.*	*Projected.*
10,000-ton Cruisers.. ..	2	1[1]	3	1[2]
Smaller Cruisers	1	—	6	2[2]
Flotilla Leaders	13	6[2]	2	—
Destroyers	1	—	8	4[2]
Submarines	43	11[2]	14	22[2]

[1] "Algérie"—to be laid down in December, 1930.

[2] Deferred to next year pending the outcome of Franco-Italian conversations.

ITALY AND DISARMAMENT

The Italian attitude towards armaments in general has recently been voiced anew by Signor Mussolini in the course of a speech which he delivered during the annual celebration of the March on Rome to the Directors of the Fascist Provincial Federations and other notabilities. He said: "Preparations for military warfare are being hastened on our frontiers. Do you see this bunch of papers? Here are noted down day by day the military preparations of the years 1927, 1928, 1929 and 1930, made against Italy. . . . Here is a list of the batteries put into position, of the forts which have been constructed, of the armaments which have been ordered and actually delivered. . . . Naturally, those from whose faces the mask has been torn tried to invert the real position and once again represent Italy as being the only source of danger to the peace of Europe, the only nation of wolves amid the bleating flock of pacific lambs. . . . Fascist Italy is arming relatively to the others, because all are arming. She will disarm if all disarm. I repeat that so long as guns exist, they will be more beautiful, than beautiful, but often

vain, words. When the word alone is sufficient to regulate the affairs of the nation, then I will say that words are divine."

WHITE SEA FISHERIES

A temporary Anglo-Soviet Fisheries Agreement was signed in London at the end of June.

The first Article of the Treaty states that :—

(1) The Government of the Union of Soviet Socialist Republics agree that fishing boats registered at the ports of the United Kingdom may fish at a distance of from three to twelve geographical miles from low water mark along the Northern coasts of the Union of Soviet Socialist Republics and the islands dependent thereon, and will permit such boats to navigate and anchor in all waters contiguous to the Northern coasts of the Union of Soviet Socialist Republics.

(2) As regards bays, the distance of three miles shall be measured from a straight line drawn across the bay in the part nearest the entrance, at the first point where the width does not exceed ten miles.

(3) As regards the White Sea, fishing operations by fishing boats registered at the ports of the United Kingdom may be carried on to the North of Latitude 68° 10′ North, outside a distance of three miles from the land.

(4) The waters to which this temporary agreement applies shall be those lying between the meridians of 23° and 48° East Longitude.

The agreement is made without prejudice to the views held by either contracting Government as to the limits in international law of territorial waters, and the British Government adheres in a protocol to its view as to the right of British boats to fish in waters to which the agreement does not apply.

The agreement will remain in force until a formal Convention is concluded, subject to six months' notice of termination on either side.

CHINA

The Military Situation.

RENEWED attempts made by the National Army during July to capture Kaifeng obtained some initial success, but a counter-offensive by Feng Yu-Hsiang's reserves on the northern flank compelled Chiang Kai-Shek to withdraw. After this withdrawal the National Army in Honan remained on the defensive and a situation of

stalemate developed, while the centre of military activity shifted to Shantung.

In Shantung Chiang-kai-Shek recaptured Tsinan on 15th August. That little serious opposition was experienced was probably due to internal jealousies and lack of co-operation between the northern commanders. The northern officials departed in good time, but the troops appear to have fled precipitately towards the Yellow River, abandoning considerable quantities of arms and equipment, including three new aeroplanes. After recapturing Binan, Chiang-kai-Shek's troops were successful in preventing a large proportion of the enemy from making good their retreat over the Yellow River, but the pursuit was not carried into the province of Chihli. A defensive position was taken up along the Yellow River with a bridgehead at Yucheng, twenty-five miles North West of Tsinan, thus permitting the transference of troops to reinforce the Honan front against Feng-Yu-Hsiang and to deal with the Communists. This position was being held by troops under Han-fu-Chu, recently reported to have decided " to retire into private life and to travel abroad." An interesting feature of the Shantung campaign is that Chiang-kai-Shek made use of his " command of the sea," and disembarked at Tsingtao reinforcements brought by sea from Canton. Chiang-kai-Shek made an effort after his victory to effect a compromise with the forces of Yen-Hsi-Shan by offering an amnesty to all the latter's troops who would abandon their leaders.

In the meantime, Feng-Yu-Hsiang's counter-offensive along the Lunghai railway to relieve the pressure on Tsinan approached Kweiteh, but was unable to make any further advance. The despatch of Government reinforcements from the Shantung front rendered it improbable that Feng would be able to achieve anything decisive. Eastern Honan is intersected by many waterways, and the country is reported to be completely waterlogged.

In the region South of the Yangtze, Changsha, which was occupied by a Communist-bandit army on 28th July, has been re-occupied by Government troops, rather as the result of the voluntary withdrawal elsewhere of the Communists in search of more loot than of actual fighting.

Anxiety regarding the safety of Hankow, which necessitated the despatch of a detachment of the Green Howards from Shanghai as a precautionary measure, has been dispelled for the present. The troops have now returned to Shanghai in H.M.S. " Cumberland " on the understanding that they will again be despatched if the necessity arises. The National Government, after the Shantung victory, have more troops at their disposal, and are trying to deal with the Communist menace.

The Chinese military authorities have officially announced that large bodies of Government troops have been collected on the Wuhu-Hankow area with instructions to take protective measures.

It is reported that the Communists have decided not to attack large cities, but to rely on fomenting internal risings.

Towards the middle of September, Chiang Kai-shek, after capturing Tsinan-Fu and causing the retreat of Yen's forces over the Yellow River, commenced an offensive against Feng Yu-Hsiang on the Lunghai front. This offensive apparently produced little result, but, in the meantime, various " face-saving " negotiations seem to have been taking place in the background. The " Northern government," reported to be in process of formation by Yen Hsi-shan, appeared to hang fire and the position seemed again to be becoming a stalemate, when on 18th September, Chang Hsueh-liang, after a conference of the Mukden authorities, issued a circular telegram calling for a cessation of hostilities. At the same time he moved his forces to occupy the province of Chihli. Tientsin was taken over by Manchurian forces without incident, in fact with the active assistance of Yen's troops, on 21st September. The Shansi forces withdrew peacefully to the South-West. Peking was occupied by Chang's troops on 23rd September.

Chang's declaration proposed an immediate armistice and that Feng, Yen and Chiang Kai-shek should maintain the *status quo* during peace negotiations. Failing assent, Chang is stated to have threatened to take punitive measures against those refusing to comply with his conditions.

The declaration was preceded by a statement by Yen in an endeavour to " save face " and pave the way for his retirement to Shansi. Chang, on his side, has stated that the occupation of Chihli is not to be considered as being in any way hostile to Yen, but as a move in support of the Manchurian policy of armed mediation through the Central Government at Nanking.

The Nanking authorities profess great satisfaction at Mukden's timely co-operation, but are of course aware that Chang Hsueh-liang is not acting from entirely disinterested motives. There is a possibility that he intends to use this opportunity to extend his influence over the whole of North China by placing control in the hands of military leaders affiliated to Mukden. He is also credited with endeavouring to create a buffer state between Manchuria and China South of the Great Wall by establishing a " neutral zone " which is to include Shantung. Chang Hsueh-liang has timed his intervention well, and for the next few weeks, at any rate, holds the key to the situation.

The civil war situation has not been greatly relieved by Chang Hsueh-liang's intervention. The main Nanking forces are still pinned

down on the Lunghai front against Feng Yu-Hsiang, and no troops can be spared to deal with the communist bandits in the Yangtze Valley, whose activities are becoming more serious. Firing on ships in the middle river between Hankow and Nanking is almost a daily occurrence, and river navigation is being further seriously interfered with by the removal of beacons. This state of affairs appears likely to continue until the Nanking Government forces are available to drive the bandits from the Yangtze Valley.

The position of the Nanking Government is still insecure. In spite of their military effort, they have been unable to crush their enemies in the field; the armies of Feng Yu-Hsiang and Yen Hsi-shan are still in being. These leaders are evidently in agreement with Chang Hsueh-liang, whose real sympathies should apparently be with the North rather than with the South. A further complication for the Nanking Government lies in the report that Wu Pei-fu, a veteran of the Chinese civil wars, who retired into private life some years ago, is ready to emerge once again and lead a " popular " movement against them.

Wu Pei-fu is the most popular soldier in China. In 1923 he led his armies from Ichang to the Great Wall, where he was double-crossed by the " Christian " General Feng, and retired to Szechuan, where he now lives. Several Nanking generals are said to be desirous of renewing their allegiance to him. If this results, the position of the Nanking Government might be seriously compromised.

The situation in South China has remained comparatively quiet. The Kwantung Government, in conjunction with the Yunnanese forces, have been operating against the Kwangsi rebels and have driven them northwards. Kwelin and Nanning have been reported captured by Government forces. The " Ironsides," under the notorious Chang-Fat-Kwei, have withdrawn towards the Yangtze Valley, where they took part in the recent occupation of Changsa.

Political Developments.

The recapture of Tsinan and the holding up of Feng-Yu-Hsiang's offensive near Kweiteh have enhanced the prestige of the National Government. At the same time, their enemies in the field have not yet been dispersed, and, until this is accomplished, there appears to be little prospect of an end to civil war. The onset of winter, at the end of October, will have immobilized both sides, but unless some compromise is shortly entered into, a recrudescence of civil war next Spring seems certain.

The spread of Communism is causing very serious misgiving to the Chinese, especially the Manchurians. Up to the present Chang-Hsueh-

Liang, the ruler of Manchuria, has resisted all efforts on the part of both the Northerners and the National Government to intervene on their respective sides. He maintains certain troops near Shanhai-Kwan, immediately South of the Great Wall; some of these troops have been moved South, to the outskirts of Peiping (Peking), but there is no indication as yet that he intends to use them against either side; he aspires, however, to control the Peiping-Tientsin area. On the whole, it seems unlikely that he will be drawn into the conflict, unless the Communist menace encroaches on his domain.

The financial situation of the National Government is deplorable. They have managed to float a new loan secured on the Customs surplus, but all available funds are immediately appropriated for military expenditure. Salaries of administrative officials are in arrears, and partial payment of the armies is only maintained with great difficulty. Against this must be set the fact that the Northern leaders are in a worse plight, with the possible exception of Feng-Yu-Hsiang, who is believed to be receiving financial aid from Moscow.

With reference to the activities of the former extremist, Wang-Ching-Wei, it is reported that at a meeting of the so-called enlarged plenary session of the Central Executive Council of the Kuomintang, held on 1st September, a Northern government was established. A state council of seven members was appointed with Yen-Hsi-Shan as chairman. Chang-Hsueh-Liang, the ruler of Manchuria, was nominated a member as well as Feng-Yu-Hsiang and Wang-Ching-Wei. As far as is known, Chang-Hsueh-Liang has entirely ignored the invitation.

BOLIVIA AND PARAQUAY

A URUGUAYAN Military Commission was sent to Fort Vanguardia in May in accordance with the agreement signed between Bolivia and Paraguay. The Commission's duty has been to superintend the construction of the fort by the Paraguayans prior to delivery to the Bolivians in exchange for Fort Boqueron. The work at Fort Vanguardia is nearly completed, and with the handing over of these forts it is hoped that the dispute between Bolivia and Paraguay will be settled.

Centenary

OF THE

Royal United Service Institution

25th June, 1931

HISTORY

The Royal United Service Institution was founded on the 25th June, 1831, at a meeting of distinguished and representative naval and military officers, which took place at the Thatched House Tavern, St. James Street.

The resolution, passed at that meeting, ran as follows:—"His Majesty [King William IV] having graciously condescended to patronize the proposed Institution that it be now formed and designated 'The Naval and Military Library and Museum.'" His Grace the Duke of Wellington was elected as Vice-Patron.

Although the name was changed several times before the grant of the Royal Charter in 1860, when the present title was bestowed, the general aims, work and Service associations of the Institution have been continuous since its foundation.

CELEBRATION.

As reported in the August JOURNAL, the Council have decided that the Centenary of the Foundation of the Institution shall be celebrated on Thursday, the 25th June, 1931, or on some convenient day near that date.

A Special Committee has been appointed consisting of four Members of the Council, and four Members not on the Council, with the Chairman and Vice-Chairman as *ex-officio* Members, to initiate proposals for suitably commemorating the event.

A special Fund, known as the Centenary Fund, has been opened with a view to securing some object or objects of lasting benefit to the Institution or Museum. The Centenary Committee have recommended that the first purpose of the Fund shall be the acquisition of a portrait of H.M. The King.

Donations, however small, will be most welcome. Cheques should be made payable to "The Royal United Service Institution" and crossed "A/c. of Centenary Fund."

The Committee are also engaged on plans for a Reception to be held on the evening of the Anniversary of the Centenary, or some other convenient day near that date, but no part of the Centenary Fund will be devoted to this entertainment.

CORRESPONDENCE

[*Correspondence is invited on subjects which have been dealt with in the* JOURNAL, *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.]

THE INFLUENCE OF AIRCRAFT ON SEA POWER

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Commander Burney is reported in the JOURNAL for August (p. 548) to have said :—" I venture to think that the first action taken by a belligerent power would be to proclaim a blockade which would extend to within 400 or 500 miles of the coast, and to say that any merchant ship, and, of course, any warship of the enemy entering that area would be sunk at sight."

What does Commander Burney mean by " proclaiming a blockade " ? I presume that he means that a certain area, or length of coastline, or certain ports will be proclaimed in the proper form, as required by International Law, to be under blockade : and the reference to " 400 or 500 miles " from the coast implies that his blockading forces will operate to that distance. Is he, however, not confusing a " blockade " with a " war zone " ? If a " blockade " is declared it does not apply merely to ships of the enemy, but to all ships, neutrals included. Does he then mean that any ship, neutral or enemy, moving within this 400 mile radius, will be sunk at sight ? If not, the word " blockade " has no meaning whatever. If, on the other hand, he does mean this, does he suppose that any neutrals are going to accept such treatment without objection ? Most narrow waters are highways. The Channel is a highway to Northern Europe, the Western basin of the Mediterranean is a highway to the Levant and to the Far East. Is it supposed that France, for example, in a war with either England or Italy, could proclaim a blockade on England or Italy, and exercise it by sinking any vessels that attempted to traverse the Channel or the Western Basin in the Mediterranean ? The thing is beyond all possibility. This country would never, it may confidently be averred, allow its merchant shipping thus to be treated in the Mediterranean ; and she is one only of the many nations who would very quickly assert their rights, which are undoubted. Would, again, the Northern Powers, or the neutrals trading with them, among whom is the United States, acquiesce in their shipping in the Channel or in the Mediterranean being bombed in this manner ?

If, however, Commander Burney does not mean that a blockade, in its accepted technical and legal sense, would be declared, but that his hypothetical belligerent would declare a " war zone " in such areas as he indicates, one must ask, is Sir Dennistoun acquainted with the precedents concerning war zones, and the rights appertaining to belligerents in that respect ? And, if the action he proposed *vis-à-vis* merchant ships is intended to be restricted to those belonging to the enemy, why is there need to place a limit upon the instrument which will apply these methods ? Is it aircraft only which will thus act, or will surface and submarines similarly sink at sight ? Submarines, it would appear, will be affected

by the agreement in the recent Treaty of London. Are we to suppose that the maritime Powers, having recently abjured the power to use submarines in this manner, will stultify the measure by extending to aircraft those very powers?

One would also wish to know in what manner the bombers will establish the identity of the ships they propose thus summarily to destroy. The fact of their being in convoy? Will they necessarily be in convoy? And, if they are, does this confer upon the enemy a right to destroy them? I am aware that there are writers who assume that it does, but is that assumption valid in International Law? Identification appears to be not much easier for a bomber than for a submarine. She can, it is true, see more: she may be able to read a name; but what evidence are either a name or a flag of the identity of a vessel?

I cannot help thinking that there is a good deal of loose thinking on this matter. Officers and others talk very freely about "declaring blockades," but they seem to do so without any very clear idea as to all that is implied in that process, either in the legal meaning or in its practical execution. I should like very much, for instance, to be shown the precise terms in which, in a suppositious war between Spain and France, Commander Burney imagines that Spain would issue her declaration of blockade; and how she would deal with ships passing through the Straits of Gibraltar flying the British flag; and what would have been his attitude, if he were again in Parliament, as to insisting upon British shipping not being sunk, or British interests not being subjected to losses, by action on the part of Spanish aviators in sinking at sight any vessel they supposed to be French, but whose identity they were unable to establish. And I should further like to know whether it is his view that the freedom to sink, now denied by international agreement to the submarine, should be permitted to other vessels; and if so, why? In the interests of Great Britain, of the world, or of aviation?

I am, Sir,
Yours, etc.,
H. W. RICHMOND,
Admiral.

LONDON.
September, 1930.

AIRCRAFT CARRIERS OR FLYING BOATS

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Will you permit me to offer some criticism on the article by Commander G. C. E. Hampden, R.N., which appeared under this title in the August number. The author lays down that a flying boat is of no use unless she can alight and replenish, or remain in the air, for three weeks, without losing her efficiency or wearing out her crew. I would like to ask how often does a modern man-of-war even in war time, remain three weeks at sea Surely the flying boat, even if in close attendance on the warship, will be within four or five hours' flight of some land where she can refuel, for the warship will not always be cruising over 500 miles from land; moreover, the utility of aircraft will be destroyed as a look-out aiding the warship if it is always retained within visual signalling distance of the warship.

I think the author rather tends to shut his eyes to the all-round improvement in aviation. I seem to remember occasions when aeroplanes have carried out their duties while destroyers have had to give up their task and return to port. Aeroplanes can fly in any weather: I make this statement without fear of criticism, based as it is on a good many years at the rudder-bar of aeroplanes, flying boats

and seaplanes. I have frequently alighted and taken off in an old underpowered seaplane midway between Socotra and Ceylon. Two flights have recently been carried out in America with a duration of over the three weeks laid down by the author. The aircraft were refuelled whilst in flight. Air navigation nowadays is a very exact science, and I could guarantee always finding a warship.

Again, does not the author confuse the functions of aircraft working with a battlefleet with those of aircraft working with a cruiser; they are entirely different. In the case of the former, unless the fleet has entirely changed, it cannot remain at sea for these long periods and still hope to be attended by its destroyer flotillas, therefore the need for such great endurance by attendant flying boats does not arise.

The author is surely out of date in alluding, as he does, to promiscuous torpedo and bomb attacks. Might not a torpedo attack proper cripple the enemy fleet before our own fleet could bring it to battle; and should not this attack be one of the all important preliminary roles of our aircraft? Moreover, it should be possible to establish the personal touch, which the author emphasizes, by putting a man on board a large flying boat whilst still in the air. This can be done with ease; changing from one aeroplane to another whilst both are in flight has been effected times without number. On page 553 of the article there is a very bold statement that aeroplane engines, being of the reciprocating type, cannot be expected to run without repairs for as long as a ship's turbines. This may have been true in 1911, but nowadays one can point to the "Southampton's" cruise in 1929 and the endurance test of the Gipsy engine in 1929. Incidentally, the Cairo to Capetown return flight, 11,200 miles, has been done more than once without any repairs.

The article referred to might be criticized at much greater length, but to do so would encroach too far on your space.

I am, Sir,
Yours, etc.,
C. R. SAMSON,
Air Commodore

Salisbury.
August, 1930.

THE AFTERMATH OF THE LONDON NAVAL CONFERENCE

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In the August JOURNAL the article on "The Aftermath of the London Naval Conference" concludes by reminding us of the words of Sir William Napier about the indifference of the English people to "martial establishments" in peace. The following quotation from the "Select Essayes and Observations, by that Renowned and Learned Knight, Sir Walter Raleigh," printed in 1650, also seems to be very appropriate at the present time:—

NAVY AND SEA SERVICE

"But now forasmuch as I doubt not, but that some contrary spirits may or will object this as sufficient reason to infirme all those points that I have formerly spoken of and say unto me, why should his Majesty and the State bee troubled with this needlesse charge of keeping and maintaining so great a Navy in such exquisite perfection, and readinesse? the times being now peaceable, and lit e use of Armes or Ships of Warre, either at Home or Abroad, but all safe and secure, as well by the uniting of the

two Nations as by the Peace which we hold with Spaine and all other Christian Princes.

To this I answer, that this (indeed) may stand (at the first sight) for a prettie superficiall argument to bleare our eys, and lull us negligent and carelesse of those causes from whence the effects of Peace grows, and by the vertue whereof it must be maintained. But we must not flatter and deceive ourselves, to thinke that this Calme and Concord proceeds either from a setled immutable tranquillity in the world (which is full of alterations and various humours) or from the good affections of our late enemies, who have tasted too many disgraces, repulses and losses, by our forces and shipping, to wish our State so much felicity as a happy and peaceable government, if otherwise they had power to hinder it. And therefore though the sword be put into the sheath, we must not suffer it there to rust, or stick so fast, that we shall not be able to draw it readily when need require. For albeit our enemies have of late sought peace with us, yet hath it proceeded out of the former tryall of our forces in time of war and Enmity.

And well we may be assured, that if those powerfull means whereby we reduced them to that modestie and curtesie as to seeke us, were utterly laid aside and neglected, so as we could not againe upon occasion readily assume the use and benefit of them, as we have done, those proud mastering spirits finding us at such advantage, would be more ready and willing to shake us by the ears as enemies, than to take us by the hand as friends. And therefore far be it from our hearts to trust more to that friendship of strangers, that is but dissembled upon policy and necessity, than to the strength of our owne forces, which hath been experienced with such happy successe.

I confesse that peace is a great blessing of God, and blessed are the Peacemakers, and therefore doubtlesse blessed are those means whereby peace is gained and maintained, for well we know that God worketh all things here amongst us mediately by a secondary means, the which means of our defence and safety being shipping, and Sea-Forces, are to be esteemed as his guifts, and then only availeable and beneficiall, when he withall vouchsafeth his grace to use them aright."

I am, Sir,

Portsmouth. Yours, etc.,

August, 1930. A NAVAL READER

ECONOMY OF FORCES

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Surely the author of the article "Economy of Forces" in your August number goes too far when he asserts that the word "Economy" is always synonymous with reduction.

In the phrase "Domestic Economy" there is not necessarily a hint of parsimony. The "Oeconomics" of Xenophon describe a happy and well-run household, where the lady of the house gets good value for her money.

In theology the expression " The Economy " does not bear out the views of your writer. Newman's definition is of interest :—

> " The principle of the Economy is this : that out of various courses, in religious conduct or statement, all and each *allowable antecedently and in themselves*, that ought to be taken which is most expedient and most suitable at the time for the object in hand."

For the words " in religious conduct or statement " substitute " in any military problem " and the definition of the Economy is worth the consideration of soldiers.

Chess problemists constantly use the word " economy " to signify that each piece has a definite and useful role to fill, and that it is in a position so to fill it.

" Phormio " will, however, not have written in vain if his letter leads to the entire elimination of those " jewels three words long " which, as Captain Liddell Hart puts it, masquerade as " Principles of War." My own views about this dope and the purveyors of it can be found in the " Quarterly Review," October, 1927, pages 280 and 281.

I am, Sir,

Yours, etc.,

F. E. WHITTON,

Lieutenant-Colonel.

West Byfleet,

August, 1930.

THE ARMY AND COMMISSIONED WARRANT RANK

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—There is very real difficulty to-day in obtaining recruits for both the rank and file and the officer class of the Army. The reason for this is, probably, lack of prospects. A potential candidate for the ranks can only see ahead of him from three to twelve years with the colours and then the difficulty of obtaining employment in an overflowing labour market. A small percentage can serve twenty-one years and obtain a small pension, while only one in a thousand can attain officers' rank. This state of affairs makes the headmasters of elementary schools advise their brightest pupils to avoid the Army if they wish to do well in life.

The Army is losing the services of much of the cream of the public schools for the same reason. No headmaster will advise a parent to send his son to Woolwich or Sandhurst when the normal outlook is twenty to thirty years' service and retirement with a pension, small compared with the educational, social and military attainments expected of the officer.

One way of improving these conditions appears to be the introduction of Commissioned Warrant Rank into the Army. If three quarters of the strength of Subalterns and one quarter of Captains were replaced by Commissioned Warrant Officers, there would be an outlet of promotion for the rank and file and, in the officer class, the difference in proportion between the strengths of the senior and junior ranks would be one quarter of what it is at present, and rapid promotion and higher rank and pension on retirement would be the outlook.

The suggested scheme is that candidates for Warrant rank should be :—

(*a*) N.C.O's of at least four years' service.

(*b*) Between twenty-three and twenty-six years of age.

(*c*) Have passed a special educational test.

Candidates fulfilling these conditions would be allowed to sit in a competitive military examination for the vacancies which exist.

The successful candidate would then be granted the rank of "Acting Warrant Second Lieutenant," and would do a six months' course at a Warrant Officers' School. On completing this he would join his unit and, after one year's service, have his acting rank confirmed.

The Warrant Second Lieutenant would wear the same badges of rank, and would rank with but after the direct entry Second Lieutenant. After eight years' service in this rank the Warrant Second Lieutenant would be promoted Warrant Lieutenant.

Finally, one quarter of the vacancies in the Captains' list would be filled by officers promoted from Warrant Rank. These officers would be retired at the age of forty-five with an adequate pension.

This scheme would most certainly improve recruiting in all classes of the Army, and should also appeal to the Treasury because the pay and pension of the Warrant Officer would, quite fairly, be less than that given to the direct entry officer who is at present pushed out of the Service with Major's rank only because no vacancy in higher rank exists.

I am, Sir,
Yours, etc.,

Plymouth,
August, 1930.

J. H. MOXHAM,
Lieutenant, R.M.

NAVY NOTES

GREAT BRITAIN

H.R.H. The Prince of Wales.

In pursuance of His Majesty's pleasure, Captain H.R.H. The Prince of Wales, K.G., K.T., K.P., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., G.B.E., M.C., has been promoted to the rank of Vice-Admiral in His Majesty's Fleet from 1st September, 1930.

First Lord's Cruise.

Mr. A. V. Alexander, First Lord of the Admiralty, accompanied by Rear-Admiral G. K. Chetwode, C.B., C.B.E., Naval Secretary, left London on 21st August and embarked next day at Marseilles in the sloop "Bryony" for Malta, where he visited the ships and naval establishments during a week's stay from 24th August to 1st September. The First Lord returned in the "Bryony" to Naples, and visited Rome and Paris, where he conferred with the Italian and French Naval Ministers. He returned to duty at the Admiralty on 15th September.

Flag List Changes.

The Admiralty's policy, mentioned in these Notes last quarter, to reduce the strength of the active list of Rear-Admirals by not promoting Captains in all the vacancies which occur, has been continued. Four voluntary retirements have taken place without corresponding promotions; the total of Rear-Admirals has, therefore, declined from forty-five to forty-one.

The following have been placed on the retired list at their own request:—Rear-Admiral J. W. Carrington, D.S.O., to date 1st August; Rear-Admiral N. E. Archdale, C.B.E., 30th August; Rear-Admiral Geoffrey Hopwood, C.B.E., 1st September; and Rear-Admiral Gerard Aylmer Wells, 11th September.

Flag Appointments.

China Station.—Vice-Admiral W. A. Howard Kelly, C.B., C.M.G., M.V.O., has been appointed Commander-in-Chief, China Station, in succession to Admiral Sir Arthur Waistell, K.C.B., to date 12th December. Vice-Admiral Kelly will assume command about 27th February next.

First Battle Squadron.—Vice-Admiral Kelly hauled down his flag as Vice-Admiral Commanding the First Battle Squadron, and Second-in-Command, Mediterranean Station, on 10th October, at Marseilles, and was succeeded by Vice-Admiral Sir William Fisher, K.C.B., C.V.O., late Deputy Chief of the Naval Staff.

Africa Station.—Vice-Admiral Hugh J. Tweedie, C.B., is to be Commander-in-Chief, Africa Station, in succession to Vice-Admiral Rudolf M. Burmester, C.B., C.M.G., to date 9th January, 1931.

Third Cruiser Squadron.—Rear-Admiral Barry E. Domvile, C.B., C.M.G., late Director of Naval Intelligence, is to be Rear-Admiral Commanding the Third Cruiser Squadron, Mediterranean Station, in succession to Rear-Admiral Arthur J. Davies, C.B., to date 27th December. The transfer of command will take place about the end of January.

MEDITERRANEAN DESTROYERS.—Rear-Admiral C. M. Forbes, C.B., D.S.O., assumed command of the Destroyer Flotillas of the Mediterranean Fleet on 1st September, in succession to Rear-Admiral the Hon. A. B. S. Dutton, C.B., C.M.G. The transfer took place at Gibraltar, and concurrently the "Coventry," after refit at home, resumed duty as flagship, in place of the "Cairo," which was reduced to reserve.

MATERIAL.

"LEANDER" LAID DOWN.—The keel-plate of the "Leander," the one cruiser which is being proceeded with of the 1929 programme, was laid at Devonport Dockyard on 8th September. The ceremony was performed by the Viscountess Cantelupe, wife of Major-General Sir George Jeffreys, G.O.C., Wessex Area.

"DORSETSHIRE" COMPLETED.—H.M.S. "Dorsetshire" commissioned at Portsmouth on 16th September with a full Devonport crew under Captain Isham W. Gibson, O.B.E., M.V.O., for service in the Second Cruiser Squadron, Atlantic Fleet, in place of the "Frobisher." The "Dorsetshire" was the last of the three cruisers built under the 1926 Navy Estimates.

NEW SLOOPS.—H.M.S. "Scarborough" commissioned at Chatham on 8th August with a full crew for temporary service in the First Minesweeping Flotilla until the end of October. She was later to relieve the "Wistaria" on the America and West Indies Station.

H.M.S. "Folkestone" commissioned at Portsmouth on 1st July with a full crew for service in the Persian Gulf, in place of the "Crocus," which had previously been condemned as unseaworthy and was paid off at Bombay on 24th April.

H.M.S. "Hastings" is due to commission at Devonport for acceptance trials on 27th November, and the "Penzance" about the end of December. Both are to be sent to the Persian Gulf.

DESTROYERS LAID DOWN.—The keels were laid at Portsmouth Dockyard on 12th September of two of the four destroyers of the 1929 programme, the "Comet" and "Crusader." There was also begun on the same day the "Nightingale," a new torpedo school tender.

DESTROYER LAUNCHES.—Further destroyers of the 1928 programme have taken the water since the last issue of the Journal. The "Boadicea" was launched by Hawthorn Leslie & Co., on the Tyne, on 23rd September. The "Beagle" was launched by John Brown & Co., Clydebank, on 26th September. The "Brilliant" was launched by Messrs. Swan, Hunter & Wigham Richardson, at Wallsend-on-Tyne, on 9th October. Only one more of the eight destroyers in this group remains to be put afloat—the "Bulldog."

SUBMARINES NAMED.—There were three submarines in the 1929 programme, as reduced. On 2nd September, the Admiralty announced that the names chosen for them were:—"Swordfish" and "Sturgeon" at Chatham Dockyard; and "Thames," to be built by Vickers-Armstrongs, Ltd.

FISHERY RESEARCH VESSEL.—The keel-plate was laid on 1st September, in the presence of Dr. Addison, Minister of Agriculture and Fisheries, of the "Challenger," the new vessel for fishery research which is being built at Chatham Dockyard for service under the Ministry of Agriculture and Fisheries. Although last borne by a cruiser, the name "Challenger" is chiefly known for its association with the scientific expedition round the world commanded by Admiral Sir George Nares in the seventies.

Personnel.

Destroyer Officers at Tactical School.—Attention is called to the facilities which exist at the Tactical School, Portsmouth, for the instruction of officers in problems connected with destroyer work. It is particularly desired, states a recent Fleet Order, that officers who have passed for command of destroyers, but who have not yet held such a command, should attend at the School during the periods when destroyer work is being specially dealt with.

Advanced Engineering Prize.—A prize of £20 has been awarded to Lieutenant (E.) P. K. L. Fry, R.N., of H.M.S. "Valiant," on the result of the final examination held on the conclusion of the advanced engineering course at the R.N. College, Greenwich, in July last.

Victualling Allowances Reduced.—From 1st October, the rate of victualling allowance was reduced from 1s. 4d. to 1s. 3½d. a day. The rate of provision allowance for officers was reduced from 3s. 3d. a day, or £52 10s. a year, to 3s. 2d. a day, or £51 a year. Provision allowance for men (also long leave allowance) was reduced from 2s. 5d. to 2s. 4d. a day.

Passage Facilities for Families.—Arrangements have been made with the P. and O. Company by which 1st and 2nd class return tickets between Malta and London, and Malta and Marseilles, will be issuable to the wives and families of officers of and above the rank of warrant officers at specially reduced rates. This is on the condition that the tickets are issued outward only between the beginning of December and the end of August, and homeward between the beginning of June and the end of February. For the purpose of this concession the term "family" means the wives and children of officers, and nurses or other delegated persons accompanying children separately from their parents.

Uniform Shirts.—A Fleet Order provides that shirts, with loose soft cuffs (either single or double) and links may be worn with undress, except on patrol, and with white undress on occasions (e), (k), (l), except on patrol, and (m).

New Detector Badges.—By a Fleet Order dated 26th September, it was decided to introduce distinguishing badges for submarine detector ratings. The general design represents a harpoon and coil crossed by a streak of lightning, and is worn plain by submarine detector operators; with a star above for submarine detectors, 2nd class; with stars above and below for submarine detectors, 1st class; and with a crown above for submarine detector instructors.

Deep Sea Diving.—Now that diving to much greater depths than were formerly possible is a practicability, the Admiralty have instituted the new non-substantive ratings of Seaman Deep Diver, with extra pay of 9d. a day, and Artificer Deep Diver, with extra pay of 1s. 2d. a day, for men required to operate at abnormal depths. Diving operations with the new methods have been carried out at depths up to 58 fathoms.

Officers' Stewards and Cooks.—It has been decided that in future the Officers' Stewards and Cooks in H.M. ships and establishments are to be deemed part of the accountant branch, and are to be placed under the control of the Accountant Officer.

Exercises and Cruises.

Atlantic Fleet Autumn Cruise.—Ships of the Atlantic Fleet left their home ports on 9th and 10th September for the East Coast of Scotland, the heavy ships going to Invergordon and the destroyers and submarines to Rosyth. In the

week beginning 22nd September, a very full programme of exercises and practices was carried out, and representatives of the Press, as in past years, were permitted to attend in the principal ships. Admiral Sir Michael Hodges was in command, and on the 22nd and 23rd a strategical exercise was carried out by a hostile force, "Blue," under Vice-Admiral A. D. P. R. Pound, Commanding the Battle Cruiser Squadron; and a defending or "Red" Force, under Rear-Admiral C. J. C. Little, Rear-Admiral in the Second Battle Squadron.

VISIT TO ANTWERP.—On the invitation of the municipality of Antwerp, a party of members of the Royal Naval Division Association, among whom were Major-General Sir Archibald Paris, K.C.B., R.M., and Captain Earl Howe, P.C., C.B.E., V.D., R.N.V.R., visited Antwerp from 26th to 29th September to take part in the commemoration of the centenary of Belgian independence, and to celebrate the assistance given by the R.N. Division in the defence of Antwerp during the late War. The party crossed to Antwerp in the destroyers "Trinidad" and "Teazer."

MEDITERRANEAN CRUISES.—The Mediterranean Fleet, under Admiral Sir Ernle Chatfield, spent the months of September and October in independent cruises in the Levant and the Adriatic. A division consisting of the "Curacoa," flagship of Rear-Admiral A. J. Davies, and the destroyers "Ardent" and "Antelope," visited Constanza from 19th to 26th August. An exchange of telegrams took place between King George and King Carol, in which King George expressed the hope that the visit would deepen the existing good relations between both countries, and King Carol announced a return visit of Roumanian warships to Malta.

AMERICA AND WEST INDIES.—Independent cruises on all parts of the Station were carried out during the quarter. On receipt of news of the hurricane at Santo Domingo, the "Danae," which had just arrived at Halifax from England to replace the "Durban," was ordered to afford assistance, and visited the place from 9th to 17th September. The "Delhi," which had cruised up the Amazon during the last part of August and the beginning of September, also went to Dominica on 20th September to give assistance there. Owing to the absence of the "Danae" at Santo Domingo, the sloop "Heliotrope" took her place at Newport, Rhode Island, during the yacht races for the America Cup. The "Danae" visited Washington from 3rd to 11th October.

CHINA STATION.—One ship of the Squadron has been stationed at Hankow throughout the quarter. The "Berwick" was there from 19th August to 29th September, when she was relieved by the "Bruce," and left to cruise in Japanese waters during October. The flagship "Kent" left Wei-Hai-Wei on 2nd October for a cruise.

ST. KILDA EVACUATION.—The residents on St. Kilda were evacuated on 29th August, when they were taken off by the sloop "Harebell" for passage to Oban, preparatory to their settlement in Morven, Argyll. The evacuation affected some thirty-six natives, together with the island nurse and the missionary and his family. Most of the sheep stock had been previously evacuated.

ORGANIZATION AND DISTRIBUTION

DEVONPORT TORPEDO SCHOOL.—Concurrently with the arrival of the "Vulcan" to form part of the "Defiance" torpedo school at Devonport, referred to last quarter, three of the four vessels hitherto in this establishment will be paid off. In future the school will include only three hulks; the "Inconstant," hitherto known as "Defiance IV," will be the only one of the old group to remain, and

the other ships will be the "Vulcan" from Portland, and the old cruiser, "Andromeda," which up to March, 1929, formed part of the "Impregnable" boys' training establishment.

THE FLEET AIR ARM

"HERMES" RECOMMISSIONED.—H.M.S. "Hermes" arrived at Portsmouth on 23rd September from a commission on the China Station, and later went round to Sheerness, where she was recommissioned on 2nd October with a Chatham crew for further service in China. Of the three flights in her, No. 403 (Fleet Fighter) and No. 440 (Fleet Spotter Reconnaissance) Flights recommissioned with the ship, except for necessary adjustments. No. 442 (Fleet Spotter Reconnaissance) Flight remained in England. Captain J. D. Campbell, M.V.O., O.B.E., was succeeded in command by Captain E. J. G. Mackinnon, D.S.O.

"COURAGEOUS" COMPLETED.—H.M.S. "Courageous," after a re-tubing refit, left Devonport for Portsmouth on 8th September. Having embarked aircraft personnel and stores, and carried out exercises, she left early in October to join the Atlantic Fleet in Cromarty Firth. H.M.S. "Furious" arrived at Devonport on 29th September to be taken in hand for a retubing refit. The following is the disposition of the Flights she had on board :—Nos. 401 (Fleet Fighter), Nos. 449 and 450 (Fleet Spotter Reconnaissance), and Nos. 463 and 464 (Fleet Torpedo Bomber), all to the "Courageous"; No. 443 (Fleet Spotter Reconnaissance), to Lee-on-Solent, temporarily.

ROYAL MARINES

NEW ADJUTANT-GENERAL.—Major-General Richard V. T. Ford, C.B., C.B.E., took over the duties of Adjutant-General, Royal Marines, on 1st October, in succession to General Sir Lewis S. T. Halliday, V.C., K.C.B. On the retirement of Sir Lewis Halliday on relinquishing his post, Lieutenant-General R. O. Paterson, O.B.E., was promoted to General; Major-General A. G. Little, C.M.G., to Lieutenant-General; Colonel Commandant (temporary Brigadier) H. A. H. Jones to be Major-General; and Colonel Second Commandant G. R. S. Hickson, C.B.E., to be Colonel Commandant (temporary Brigadier). Brigadier Hickson assumed command of the Portsmouth Division in succession to Major-General Jones. Lieutenant-Colonel A. S. Cantrell, from the R.M. Depot, Deal, was appointed Director of Naval Recruiting, in succession to Brigadier Hickson.

R.N. SCHOOL OF MUSIC TRANSFERRED.—The R.N. School of Music from the R.M. Barracks, Eastney, was transferred to the R.M. Depot, Deal, on 1st October. The personnel comprised about two hundred, and entrained at Fratton Station for Deal. Captain W. E. Faithfull, R.M., was in charge of the farewell parade, which was inspected before departure by Major-General H. A. H. Jones, and by his successor in command at Eastney, Brigadier G. R. S. Hickson, who assumed command on 1st October. The School was first formed at Portsmouth on 22nd July, 1903.

ROYAL NAVAL VOLUNTEER RESERVE

The R.N.V.R. has recently suffered the loss, under tragic circumstances, of two Commanding Officers of Divisions: Commodore Rt. Hon. H. D. King, C.B., C.B.E., D.S.O., V.D., M.P., Commanding the London Division, who was drowned

in the foundering of the yacht " Islander " on 20th August, and Captain The Marquess of Dufferin and Ava, D.S.O., A.D.C., Commanding the Ulster Division, who was killed in the aeroplane crash at Meopham, Kent, on 21st July.

With Commodore King were Surgeon Captain A. R. Brailey, V.D., K.H.S., R.N.V.R., and Commander Sydney Searle, O.B.E., V.D., R.N.V.R. (Retired), both of whom also lost their lives. Surgeon Captain Brailey was the senior officer on the list of R.N.V.R. Medical Officers.

NEW COMMANDING OFFICER.—The Earl of Kilmorey has been granted a commission as Captain, and appointed Commanding Officer of the Ulster Division, R.N.V.R., to date 30th September.

RETIREMENT.—Captain William Maples, V.D., A.D.C., R.N.V.R., the Commanding Officer of the Mersey Division, R.N.V.R., was placed on the Retired List at his own request on 30th September, 1930.

ULSTER DIVISION.—The Ulster Division sent two teams to the Ulster Rifle Association Meeting at Newtownards Rifle Range on 30th August, 1930. Ulster Division's " A " Team won the Ulster Challenge Shield, with a score of 233 points, while Ulster Division's " B " Team took fourth position with 223 points. Teams from the Ulster Rifle Club and The Royal Ulster Rifles also competed.

DOMINION NAVIES.

ROYAL AUSTRALIAN NAVY

CRUISER EXCHANGE POSTPONED.—On 3rd October, Mr. Scullin, the Prime Minister of Australia, who had arrived in London for the Imperial Conference, announced that owing to the present economic position in Australia it had been found necessary, after consultation with the British Government, to defer the arrangement for the exchange of H.M.A.S. " Canberra " with H.M.S. " Shropshire " for this year. The ships were to have left Sydney and Malta respectively about 15th October.

WINTER CRUISE.—The Australian Squadron, under Rear-Admiral E. R. G. R. Evans, consisting of the " Australia," " Albatross " and " Anzac," left Sydney on 28th July for the winter cruise. Visits were paid to Moreton Bay, Gladstone, Cairns, Palm Islands, Townsville, Port Moresby, Rabaul, Tulagi and Lizard Island, and the Squadron returned to Sydney on 30th September.

ROYAL CANADIAN NAVY

LAUNCH OF THE " SKEENA."—The destroyer " Skeena," the second of the two ordered from Messrs. Thornycroft late in 1928, was launched on 10th October the naming ceremony being performed by Miss Mildred Bennett, sister of the Canadian Prime Minister. The " Saguenay," launched on 11th July, is expected to be completed in March, 1931, and the " Skeena " a month later.

ROYAL INDIAN MARINE

NEW SLOOP COMPLETED.—The sloop " Hindustan," of a similar type to the " Bridgewater " class in the Royal Navy, was commissioned with a Chatham navigating party at Wallsend on 9th October, and left for Portsmouth next day. Commander C. B. C. Swayne, R.N., was appointed in command for her trials and during the passage out to Bombay.

FOREIGN NAVIES

ARGENTINA

NEW CRUISER.—The cruiser "Vintecino de Mayo," built at Leghorn, has carried out steam trials. In spite of a head wind, she exceeded her designed speed of 32 knots.

NAVAL AIR SERVICE.—There are now two naval air stations; Puerto Belgrano, a coastal station, and Punta Indio, an island station used for *ab initio* flying training. British aircraft are used extensively.

NEW FLYING BOATS.—Initial trial flights were carried out satisfactorily in July with the first of eight Supermarine twin-engine "Southampton" flying boats ordered from the Supermarine Company, Southampton. The boat was erected at Puerto Belgrano.

CHILE

NEW APPOINTMENTS.—In a list of ministerial changes in Chile announced on 7th August, Captain Frodden, formerly Minister of Marine, became Minister of the Interior, and Vice-Admiral Schroders was appointed Minister of Marine.

Rear-Admiral Felipe Wiegand, the newly appointed Head of the Chilean Naval Commission in London, arrived in England on 14th August from Valparaiso. He has succeeded Admiral Luis Escobar, who has been appointed to represent Chile on the League of Nations.

FRANCE

THE CRUISER "ALGÉRIE."—The cruiser "Algérie," which is due to be laid down in December, will be better protected than earlier 10,000-ton post-Washington cruisers in the French Navy. The Paris Correspondent of the Naval and Military Record, supplies the following description:—"The 'Algérie,' though a Washington standard ship, and designed to carry the usual eight guns of 8-inch calibre in twin turrets, is no longer a *croiseur leger* but a bone-fide armoured *navire de combat*, fit, in the opinion of her designers, to meet any other 10,000-ton unit now building. Special armour, from 90 to 140 mil. thickness, will protect her against blows from all directions, the submarine and aerial dangers receiving adequate attention. Her 8-inch guns of new model are believed to be a match, in the matter of range, for the German 11-inch weapons, while they are expected to produce twice as great a volume of fire. The 'Algérie,' like Italian and British cruisers, will mount 4-inch A.A. guns; they will be eight in number. She will be flush decked, like the English and German ships, with only one funnel, the usual tripod mast aft will be replaced by a short pole mast. Care has been taken to suppress useless top hamper, and to do away with items of no military value. The hull seems to have been designed on new lines, especially as regards armoured sub-divisions and bulkheads."

NEW CONSTRUCTION.—The cruiser 'Dupleix' was launched at Brest on 9th October. President Doumergue was among those present. This is the sixth of the French post-Washington 10,000-ton cruisers. The "Foch" has commissioned for trials.

The flotilla leader "Vautour," of 2,440 tons, five 5.5-in. guns, and 37 knots speed; and the submarine "Méduse," of 570 tons, and 13½ knots speed, were launched at Havre on 2nd September.

The flotilla leader "Eperrier" has been laid down in Lorient arsenal. Vessels of this class (1927 programme) are 200 tons less displacement than the "Bison"

Class. They have only two funnels and their silhouette resembles that of the 10,000-ton cruisers. Electric welding is being used for the lighter parts in the " Eperrier's " construction. A sister ship, the " Milan," is to be laid down shortly in the same yard, and two more will follow in 1931.

The destroyer " Foudroyant " has completed her trials and is now in commission, and the flotilla leader " Vauban " has now received her armament of four 5.5-inch and four 1.5-inch guns, and four Thornycroft mortars.

SAILING SHIP INSTRUCTION.—Seamanship instruction at the French Naval Academy will in future include cruises in a sailing ship which has been purchased by the Ministry of Marine. In a circular issued by the Ministry in July, it is stated that experience has shown that " sea sense " is best acquired through service in a sailing vessel, and that navigation under sails forms the best type of training for the future naval officer. The vessel is to be sufficiently large to carry half the cadets entered in a term, and will make cruises of some duration in European and African waters.

CHANGES IN COMMAND.—Changes in command announced in August indicated the increased importance attached to the Algerian Station, which is now regarded as on an equality with the home ports. Vice-Admiral Bréart de Boisanger, who distinguished himself in the landing at Gallipoli, has been appointed to this command, and has under his orders all the naval forces in North African waters, as well as the coast defences. New Naval Prefects were at the same time appointed to the two principal ports, Vice-Admiral Pirot to Toulon and Vice-Admiral Dubois to Brest.

GERMANY

NAVAL POLICY.—During the debates on the Naval Estimates earlier in the year, the Minister of Defence announced the intention of placing before the Reichstag with the next Estimates a building programme which will give Germany in eight years time the full quota of replacement ships to which she is entitled under the Versailles Treaty. This will include :—

Five 10,000-ton armoured ships.
One 6,000-ton cruiser.
Twelve 2,100-ton torpedo boats.

BALTIC EXERCISES.—The annual gunnery exercises of the German Fleet were carried out in Kiel Bay in August, when the " Schlesien," " Hannover " " Schleswig-Holstein " and " Hessen " and the new cruiser " Königsberg," carried out target practice against the ex-battleship " Zahringen," manœuvred without a crew by wireless control from a distant vessel. On 10th September, during further exercises, the " Zahringen " burst into flames, and the 2,000 tons of cork in her interior complicated the task of extinguishing the fire. She was brought back to Holtenau, and smouldered for two days. The burning cork gave off such poisonous fumes that the firemen could work only in short shifts, but they were eventually successful in saving the ship from total destruction.

CRUISE OF THE " KARLSRUHE."—Continuing her cruise in African waters, the new cruiser " Karlsruhe " was at Zanzibar in August, and early in September was at Cape Town. Target practice was carried out off Cape Town.

DEATH OF CAPTAIN BOY-ED.—Captain Karl Boy-Ed, who was Naval Attaché under Count Bernstorff at the German Embassy at Washington when the late War broke out, was killed in September in a riding accident, between his estate near Hamburg and Trittau.

GREECE

NEW DESTROYERS.—Orders have been placed with the Odero Terni firm of shipbuilders for two more destroyers, similar to those already building there for the Greek Navy.

TRAINING SHIP CRUISE.—The Greek training ship " Ares " visited Portsmouth early in August, and remained six days. On her departure, the commanding officer, Captain Alexander E. Sakellariou, forwarded messages of thanks to the Commander-in-Chief and the Lord Mayor. To the former he wrote: " We in the Hellenic Navy have always admired the British Navy for its efficiency and the spirit of its personnel. I am very pleased that the officers, cadets, and ship's company of the ' Ares ' have been enabled to study it at first hand, and to realise why we always turn to the British Navy for our Naval Missions."

ITALY

NEW CRUISERS.—The cruiser " Alberto di Giussano," of 4,896 tons, completed her trials in September. She attained a mean speed of 39.3 knots, with a maximum of 40.7 knots, over a distance of 160 miles. Her engines, of 95,000 horse-power, developed 110,000 s.h.p.

The " Alberico da Barbiano," a sister ship, was launched at Genoa on 23rd August.

PERSIA

NEW CONSTRUCTION.—Two gunboats, of 900 tons each, and four patrol boats of 200 to 300 tons each, have been ordered in Italy for the Persian Government.

PORTUGAL

NAVAL AIRCRAFT.—Six " Moth " aeroplanes, on floats, have been supplied by the De Havilland Company to Portugal for elementary training at the Naval Air Station at Bom Sucesso, on the Tagus. Six " Macchi " flying boats, with Isotta engines, have also been supplied from Italy. Junior naval officers come regularly to Bom Sucesso for instruction in aircraft work.

RUMANIA

PROPOSED VISIT TO MALTA.—On the occasion of the British visit to Constanza between 19th and 26th August (*see* GREAT BRITAIN), King Carol sent a telegram to King George in which he expressed his thanks for the visit, and announced the coming visit of Rumanian warships to Malta. In reply, His Majesty expressed the hope that the British vessels' visit would deepen the existing good relations between both countries. Prince Nicholas, brother of King Carol and an honorary Lieutenant in the Royal Navy, will command the Rumanian squadron on this visit in the Spring of 1931.

SOVIET RUSSIA

MEDITERRANEAN CRUISE.—A squadron of the Soviet Black Sea Fleet was in September ordered to pass through the Dardanelles to undertake " military exercises " in Mediterranean waters. On 30th September, it was reported to have anchored in Phaleron Bay. The force was stated to include the " Chervonaya-Ukrainia " (Red Ukraine), a cruiser of 7,600 tons, laid down in 1914 and completed in 1923; and two minelayers, the " Niesamojnik " (Poor Peasant) and the " Shaumian " (named after an executed Armenian Bolshevik)

SPAIN

NEW CONSTRUCTION.—The 10,000-ton cruiser "Miguel de Cervantes" has completed her steam trials and is reported to have maintained an average speed of 33.99 knots on a four hours' run. Her maximum speed is said to have been 35.58 knots.

TURKEY

"YAVOUZ" COMPLETED.—The battle-cruiser "Yavouz" (ex "Goeben") is reported to have completed trials and tests after her reconditioning.

The work has been carried out by the French Chantiers et Ateliers de St. Naziare, under a contract signed in 1927.

UNITED STATES

NEW CRUISERS.—The new cruiser 'Houston" left Newport, R.I., on 30th August for a shakedown cruise to Europe, and from 8th to 17th September was at Southampton. She afterwards went to Rotterdam, Havre, and other ports. The new cruiser "Chester" left Philadelphia on 15th August for a cruise to the Mediterranean, visiting Barcelona, Naples, Constantinople and Athens. Both vessels have been assigned to Division 5, Light Cruiser Divisions, Scouting Fleet; but in the spring of 1931 the "Houston" is to relieve the "Pittsburgh" as flagship of the Commander-in-Chief, Asiatic Fleet.

WINTER FLEET EXERCISES.—Winter exercises of the United States Fleet are to be held in the Panama Canal zone. The major problem is stated to involve an attack on the Pacific entrance to the Canal, with the Scouting Fleet acting in defence. All available forces are to concentrate on 12th February, 1931, outside the entrance to Panama Bay, and will remain in the area until 24th March. The operations will be under the orders of Admiral J. E. Chase, the new Commander-in-Chief.

BATTLESHIPS FOR DISPOSAL.—The battleships "Arkansas" (flagship), "Florida" and "Utah," forming the Naval Academy Practice Squadron, cruised in European waters between 6th June and 29th August, and visited Cherbourg, Kiel, Oslo, and Leith. On the return of the Squadron, the "Arkansas'-was ordered to Norfolk Navy yard for a refit, and will relieve the "Wyoming" as flagship of Vice-Admiral A. L. Willard, Commanding the Scouting Fleet. The "Wyoming" is one of the three battleships to be scrapped under the London Treaty, and will be used for training purposes. The others to go are the "Utah" and "Florida," of which the former will be utilised as a target ship.

SMALL CRAFT FOR DISPOSAL.—The first four destroyers of the fifty-seven which are to be placed on the disposal list are the "MacDonough," "Paul Hamilton," "Zeilin" and "Reno." The whole batch was placed out of commission a year ago, and the vessels are now to be disposed of gradually.

Twelve submarines at Philadelphia have been scrapped as the first instalment of a three-year disposal programme, under which thirty-two more submarines will be removed from the list. The twelve already disposed of are "O" 11, 13, 14, 15, and 16, and "R" 21, 22, 23, 24, 25, 26 and 27. On the completion of this disposal programme, there will be on the effective list, including "V.7," now building, a total of seventy-nine submarines of 65,620 aggregate tons. The allocation of submarine tonnage in the Naval Treaty is 52,700 tons.

DOCKYARD ECONOMIES.—On 22nd August, Mr. E. L. Jahncke, Acting Secretary of the Navy, announced that he had recommended the closing of the naval establishments at Alexandria, Virginia, and South Charleston, West Virginia, and was contemplating recommending the closing of the Charleston, South Carolina, yard. It is also stated that Key West naval station is to be closed, to effect an economy of £40,000 a year.

PERSONNEL.—A big reduction in the losses from desertion was reported in the Bureau of Navigation in August. The following are the figures for the past four fiscal years :—

Fiscal Year.	*Gross Desertions.*	*Net Desertions.*
1927	3,123	1,092
1928	2,906	794
1929	2,055	528
1930	1,884	398

Two new schools for enlisted men have been established by the Bureau, an Aviation Ordnancemen School at the Naval Training Station, Hampton Roads, to provide a nine months' course in the handling of ordnance material, except torpedoes; and an Electrical Interior Communication School at the Navy Yard, Washington, for training in the upkeep and operation of interior communication instruments and circuits.

NEW AIRCRAFT-CARRIER.—Tenders were opened in the Navy Department on 3rd September for the construction of aircraft carrier No. 4, authorised by the Act of Congress of 13th February, 1929. The new vessel will displace 13,800 tons. Appropriations of 600,000 dollars in the last fiscal year, and 3,450,000 in the current fiscal year, have been provided by Congress for the ship.

(See also article on " Cruiser Types " in this Journal.)

ARMY NOTES

HOME

H.R.H. The Prince of Wales.

H.M. the King has approved of the promotion of Colonel H.R.H. The Prince of Wales and Duke of Cornwall, K.G., K.T., K.P., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., G.B.E., M.C., Personal Aide-de-Camp to the King, to the rank of Lieutenant-General.

Army Council and Commands.

The following appointments have been approved to take effect from dates to be announced later :—

General Sir Archibald A. Montgomery-Massingberd, K.C.B., K.C.M.G., to be Adjutant-General to the Forces, in succession to General Sir Walter P. Braithwaite, G.C.B., A.D.C. General; Lieutenant-General Sir Cecil F. Romer, K.C.B., K.B.E., C.M.G., to be General Officer Commanding-in-Chief, Southern Command, in succession to General Sir Archibald Montgomery-Massingberd; Lieutenant-General Sir Cyril J. Deverell, K.C.B., K.B.E., to be General Officer Commanding-in-Chief, Western Command, in succession to Lieutenant-General Sir Cecil Romer; Lieutenant-General Sir Webb Gillman, K.C.B., K.C.M.G., D.S.O., to be General Officer Commanding-in-Chief, Eastern Command, in succession to General Sir Robert D. Whigham, K.C.B., K.C.M.G., D.S.O., A.D.C. General; Major-General J. R. E. Charles, C.B., C.M.G., D.S.O., to be Master-General of the Ordnance, in succession to Lieutenant-General Sir Webb Gillman; Lieutenant-General Sir John T. Burnett-Stuart, K.B.E., C.B., C.M.G., D.S.O., to be General Officer Commanding the British Troops in Egypt, in succession to Lieutenant-General Sir E. Peter Strickland, K.C.B., K.B.E., C.M.G., D.S.O.; Lieutenant-General the Hon. Sir J. Francis Gathorne-Hardy, K.C.B., C.M.G., D.S.O., to be General Officer Commanding-in-Chief, Northern Command, in succession to Lieutenant-General Sir Cameron D. Shute, K.C.B., K.C.M.G.; Lieutenant-General Sir W. Hastings Anderson, K.C.B., to be General Officer Commanding-in-Chief, Aldershot Command, in succession to General Sir David G. M. Campbell, K.C.B.; Lieutenant-General F. F. Ready, C.B., C.S.I., C.M.G., D.S.O., to be Quartermaster-General to the Forces, in succession to Lieutenant-General Sir W. Hastings Anderson.

Appointments and Promotion.—H.M. the King-Emperor has approved the promotion of Major-General His Highness Maharaja Sir Ganga Singh, Bahadur, Maharaja of Bikaner, G.C.S.I., G.C.I.E., G.C.V.O., G.B.E., K.C.B., to the honorary rank of Lieutenant-General in the Army.

H.M. the King has approved of the appointment of General Sir Robert Whigham, K.C.B., K.C.M.G., D.S.O., Colonel, The Royal Warwickshire Regiment, as Aide-de-Camp General to the King.

H.M. the King has approved of the appointment of Colonel (temporary Brigadier) J. K. Dick-Cunyngham, C.M.G., D.S.O.; Colonel (temporary Brigadier) J. R. M. Minshull-Ford, D.S.O., M.C.; Colonel (temporary Brigadier) F. H. Stapleton, C.M.G., and Colonel L. C. Jackson, C.M.G., D.S.O.; Colonel (temporary Brigadier)

H. R. W. Marriott Smith, C.B.E., D.S.O.; Lieutenant-Colonel (Brevet Colonel) R. W. Burnyeat, D.S.O., T.D., Royal Artillery, Territorial Army, as Aides-de-Camp to the King.

H.M. the King has approved of the appointment of General Sir David Graham Musche Campbell, K.C.B., as Colonel of the 9th Queen's Royal Lancers; of Lieutenant-General Sir William Marshall, G.C.M.G., K.C.B., K.C.S.I., as Colonel of The Sherwood Foresters (Nottinghamshire and Derbyshire Regiment), in succession to the late General Sir Horace Smith-Dorrien, G.C.B., G.C.M.G., D.S.O.; of Major-General Sir Hugh Bruce-Williams, K.C.B., D.S.O., as Colonel Commandant, Royal Engineers.

The following promotions are announced:—Lieutenant-General Sir R. B. Stephens, K.C.B., C.M.G., to be General; Lieutenant-General Sir A. A. Montgomery-Massingberd, K.C.B., K.C.M.G., to be General.

Major-General F. F. Ready, C.B., C.S.I., C.M.G., D.S.O. to Lieutenant-General; Major-General B. F. Burnett Hitchcock, C.B., D.S.O., to be Lieutenant-General.

Colonel C. H. Foulkes, C.B., C.M.G., D.S.O., A.D.C. to the King; Colonel (temporary Brigadier) H. C. Jackson, C.B., C.M.G., D.S.O., A.D.C. to the King; Colonel L. H. R. Pope-Hennessy, C.B., D.S.O.; Colonel J. F. C. Fuller, C.B., C.B.E., D.S.O.; Colonel (temporary Brigadier) E. N. Broadbent, C.B., C.M.G., D.S.O., A.D.C. to the King; Colonel (temporary Brigadier) H. F. E. MacMahon, C.B.E., M.C., A.D.C., to the King (Indian Army), to be Major-Generals.

The following appointment is announced:—Major-General L. C. L. Oldfield, C.B., C.M.G., D.S.O., to be General Officer Commanding, Malaya, with effect from February, 1931, in succession to Major-General H. L. Pritchard, C.B., C.M.G., D.S.O.

THE ORDER OF PRECEDENCE.—The Order of Precedence of Units of the Army has been modified in accordance with the following Table:—

Order.	*Regiment, etc.*
1	The Life Guards and Royal Horse Guards.
2	Royal Horse Artillery (*a*).
3	Regiments of Cavalry of the Line.
4	Royal Regiment of Artillery (Royal Horse Artillery and local companies abroad excepted).
5	Corps of Royal Engineers.
6	Royal Corps of Signals.
7	Regiments of Foot Guards.
8	Regiments of Infantry of the Line (*b*).
9	Royal Tank Corps.
10	Local companies of Royal Artillery abroad.
11	Royal Malta Artillery.
12	Royal Army Chaplains' Department.
13	Royal Army Service Corps.
14	Royal Army Medical Corps.
15	Royal Army Ordnance Corps.
16	Royal Army Pay Corps.
17	Royal Army Veterinary Corps.
18	Army Educational Corps.
19	The Army Dental Corps.
20	Queen Alexandra's Imperial Military Nursing Service.
21	Royal Monmouthshire Royal Engineers (Militia) Supplementary Reserve.

Order.	*Regiment, etc.*
22	Supplementary Reserve (except as stated in 21) (*c*).
23	Militia (*c*).
24	Honourable Artillery Company (Territorial Army).
25	Territorial Army (except as stated in 24) (*c*).
26	Territorial Army Nursing Service.
27	Militia units in Bermuda, Channel Islands and Malta (*c*).
28	Officers Training Corps.

(*a*) But on parade, with their guns, to take the right and march at the head of the Household Cavalry.

(*b*) Royal Marines rank after The Royal Berkshire Regiment (Princess Charlotte of Wales's) and The Rifle Brigade (Prince Consort's Own) ranks after The Argyll and Sutherland Highlanders (Princess Louise's).

(*c*) In order of arms as for Regular Army.

REGIMENTAL COLOURS.—H.M. the King has approved that in future, where this is not already authorized, a badge selected by the regiment, and approved by the Army Council, shall be placed in the centre of a regimental colour.

CHANGES IN DESIGNATION.—1. The following changes in designation of units of the Royal Army Ordnance Corps have been approved :—

Number 9 Company, Egypt, to Number 12 Section.
Number 13 Section, Bramley, to Number 5 Section.
Number 18 Section, Didcot, to Number 4 Section.
Number 12 Section, Stirling, to Number 11 Section.

2. The unit of the Royal Corps of Signals formerly designated the Rhine Signals has been converted into the 5th Divisional Signals.

ROYAL ENGINEERS, SUPPLEMENTARY RESERVE. FORMATION OF NEW UNIT.—The formation of the following unit of the Supplementary Reserve of the Royal Engineers has been approved :—

" 109th (Glasgow) Workshop and Park Company, Royal Engineers."

TERRITORIAL ARMY

MECHANIZATION OF T.A. ARTILLERY.

The Army Council have issued the following instructions :—

1. The complete mechanization of T.A. Field Artillery is to be spread over the period 1931 to 1933 (see paragraph 5 and Appendix I).

The establishment for a completely mechanized brigade will therefore be adopted by Field Brigades in accordance with the programme laid down in Appendix I. Strengths should conform to the mechanized establishment by 1st April of the year in which it is adopted.

2. FIELD BRIGADES.—The supply of vehicles required by mechanized Field Brigades will ultimately be arranged as follows :—

(*a*) *Preliminary training.*—Normally one 6-wheeler will be issued to each battery and will be provided by the War Department. In certain large towns where there are several batteries a special scale will be applied. These vehicles will meet all the out of camp training requirements of the battery (including the battery staff), except that provision will be made for the hire of four battery staff cars for the use of each battery staff for five full battery parades annually.

The intention is that the four 6-wheelers held by a Brigade of four batteries will be collected for use by each battery in turn at these parades. The C.R.A. will be responsible for the allotment from other brigades of 6-wheelers required to turn out batteries of brigades consisting of two or three batteries only (see also Appendix II B para. 3 (*a*)).

(*b*) *Week-end Camps.*—Six-wheelers supplied under paragraph 2 (*a*) will be used at week-end camps. Hire of battery staff cars for week-end camps will be arranged as hitherto by the G.O.C.-in-C.

(*c*) *Annual Camp : 6-wheelers.*—It is necessary to complete the 6-wheelers held by each Brigade of four batteries up to ten at practice camps and sixteen at training camps, or for Brigades of two or three or five batteries to the numbers specially laid down. (See Appendix II Note to paragraph 5).

(i) *At the earlier camps.*—The deficiency will be supplied by Regular R.A.S.C. vehicles.

(ii) *At later camps.*—Six-wheelers will be withdrawn as necessary from units after the termination of their camp and used for other units.

Any deficiency which still remains will be met by Regular R.A.S.C. vehicles.

It will be noted that it is an essential feature of the scheme of supply of vehicles for camps outlined above that units should remain in possession of their 6-wheelers up to the end of their own camp but that after that they will be available for pooling for the use of other units as required.

Battery staff cars up to the numbers laid down in Establishments will be hired as hitherto by Associations.

3. MEDIUM BRIGADES.—Similar arrangements will be made for the supply of vehicles required by Medium Brigades except that special measures will if necessary be taken by W.O. to supply at camp W.D. tractors for drawing 60-pounder equipments.

4. All hiring for field and medium brigades of vehicles other than the battery staff cars referred to in paragraph 2 (*a*), (*b*) and (*c*) will cease.

5. The equipment of each battery with a 6-wheeler will be spread as evenly as possible over the three years, 1931, 1932 and 1933. The brigades which will be selected in each of these years for equipment (involving complete mechanization where this has not already been adopted), and the scale of 6-wheelers which will be issued to them, is shown in Appendix I.

In order to allow the maximum notice for preparation for the change, the following order of priority has been adopted and will be followed as far as practicable :—

(i) Brigades completely mechanized in 1930.

(ii) Brigades partly mechanized in 1930 provided with Association owned 6-wheelers.

(iii) Other brigades partly mechanized in 1930.

(iv) Brigades horsed in 1930.

Details of the administrative arrangements involved are shown in Appendix II, and of the financial arrangements in Appendix III.

(*Paras. 6 and 7 dealing with temporary arrangements are omitted.*)

APPENDIX I.

Field Artillery.

Vehicles will be issued to the following Brigades :—

In 1931. Units.	Number issued.	In 1932. Units.	Number issued.	In 1933. Units.	Number issued.
Eastern Command.		**Scottish Command.**		(*a*) The staffs of the following brigades will be mechanized and vehicles issued to them.	
59th Bde. (44th Div.) ..	4	101st (Yeo.) Bde. (52nd Div.)	5	**Eastern Command.**	
London District.		80th Bde. „ „		104th (Yeo.) (54th Div.) ..	2
63rd Bde. } 47th		78th „ (1 Bty.) „ „		108th „ „ „ ..	4
64th „ } Div.	24	78th (3 Btys.) „ „	3	97th „ (44th Div. ..	4
*65th „ }	Batteries	79th Bde. „ „	4	98th „ „ „ ..	4
*90th „ } 56th		76th Bde. (51st Div.) ..	4	**Northern Command.**	
91st „ } Div.		77th „ „ „ ..	4	107th (Yeo.) (46th Div.) ..	2
*92nd „ }	10	**Southern Command.**		**Southern Command.**	
Northern Command:		99th Bde. (Yeo.) (48th Div.)	4	94th (Yeo.) (43rd Div.) ..	3
69th Bde. (49th Div.) ..	4	**Eastern Command.**		55th Bde. „ „ ..	4
Southern Command.		57th Bde. (44th Div.) ..	4	56th „ „ „ ..	3
100th Bde. (Yeo.) (48th Div.)	5	58th „ „ „ ..	4	(*b*) The following Brigades at present horsed will be completely mechanized and vehicles issued to them.	
204th (Med. Bty.)		84th „ (54th Div.) ..	4	**Northern Command.**	
Western Command.		85th „ „ „ ..	4	60th Bde. (46th Div.) ..	4
83rd Bde. (53rd Div.) ..	4	86th „ „ „ ..	4	61st „ „ „ ..	4
87th „ (55th Div.) } 10		105th Bde. (Yeo.) (54th Div.)	4	62nd „ „ „ ..	4
89th „ „ „ } Bats	6	103rd „ „ „ „	2	72nd „ (50th Div.) ..	4
106th „ (Yeo.) (55th) }		**Northern Command.**		73rd „ „ „ ..	4
88th Bde. (55th Div.) ..	4	70th Bde. (49th Div.) ..	4	74th „ „ „ ..	4
52nd „ (42nd Div.) ..	4	71st „ „ „ ..	4	**Scottish Command.**	
53rd „ „ „ ..	4	**Western Command.**		75th Bde. (51st Div.) ..	4
93rd „ „ „ ..	2	51st Bde. (Yeo.) (42nd Div.)	4	**Southern Command.**	
102nd „ (53rd Div.) ..	4	64 Batteries	62	66th Bde. (48th Div.) ..	4
81st „ „ „ } ..	8			67th „ „ „ ..	4
82nd „ „ „ }				68th „ „ „ ..	4
77 Batteries	59			54th „ (43rd Div.) ..	4
				95th Bde. (Yeo.) (43rd Div.)	4
				96th „ „ „ „	4
				78 Batteries	78
				Total Batteries Mechanized =	219
				Total 6-wheelers required =	199

Remarks.—90th Brigade to retain horsed staffs for one year. (See Appendix II (para. 20), 65th and 92nd Brigades to mechanize battery staffs compulsorily in 1931.

Remarks.—The staff of the 90th (City of London) Brigade will be mechanized. Vehicles will be issued to the following brigades whose staffs will be mechanized.

MEDIUM BRIGADES.

Six-wheelers will be issued to the following brigades:—

	Unit.	*New Vehicles.*
1931.	LONDON DISTRICT.	
	53rd Brigade (47th Div.)	4
	SCOTTISH COMMAND.	
	56th Brigade (51st Div.)	4
	57th Brigade (52nd Div.)	4
	EASTERN COMMAND.	
	52nd Brigade (44th Div.	4
1932.	EASTERN COMMAND.	
	58th Brigade (54th Div.)	4
	NORTHERN COMMAND.	
	55th Brigade (50th Div.)	4
	54th Brigade (49th & 46th Divns.)	4
	WESTERN COMMAND.	
	59th Brigade (55th Div.)	4
1933.	SOUTHERN COMMAND.	
	51st Brigade (43rd Div.)	4
	WESTERN COMMAND.	
	60th Brigade (42nd Div.)	4
	61st (Yeo.) Brigade (53rd Div.)	4
	43 Batteries	44
	Total Batteries Mechanized = 43	
	Total 6-wheelers required = 44	

APPENDIX II.

ADMINISTRATION.

A. Preliminary arrangements.

B. Administration.

C. Transitory arrangements (1931 and 1932 only).

A. PRELIMINARY ARRANGEMENTS.

1. *Provision of Vehicles issued to units.*—In 1931, thirty out of forty-three Association 6-wheelers of approved type will be taken over at valuation and re-issued. In 1932 the remaining Association vehicles will be taken over and re-issued. The additional W.D. vehicles whose issue is required by Appendix I will be issued not later than 1st April of the year concerned.

Six-wheeled vehicles so taken over from Associations will become " R.A.S.C." vehicles and will receive " Exempt " Road Fund Licences from the date o f transfer, under W.O. arrangements.

2. *Accommodation.*—It is not anticipated that units will experience any difficulty in accommodating the 6-wheelers in existing buildings in view of the fact that H.T. wagons will be returned to the R.A.O.C.

B. Administration.

3. *Out of Camp.*—(*a*) Territorial Army Units will hold on charge 6-wheelers issued on a scale of one for each battery.[1] The vehicles will remain W.O. property and will not be transferred to an Association. In those towns in which a lower scale of vehicle applies, the C.R.A. concerned will undertake their allotment to responsible units for storage and minor maintenance, and will also co-ordinate competing demands for their use. Where two C.R.As. are concerned (e.g., London) they will co-operate. All vehicles issued to T.A. Artillery will be affiliated for purposes of inspection, maintenance and repairs to a Regular R.A.S.C. Company, through the T.A. Divisional R.A.S.C. concerned. Units will be responsible for the execution of all *minor* repairs to vehicles. Repairs beyond the capabilities of the unit will be referred to the T.A. Divisional R.A.S.C.

(*b*) The War Office will be responsible (i) for the maintenance so far as workshop repairs are concerned of all 6-wheelers issued to batteries, and (ii) for the replacement of worn-out vehicles whenever necessary. Six-wheelers, temporarily withdrawn for repair will be temporarily replaced, as far as possible, by R.A.S.C. 6-wheelers.

(*c*) Territorial Army Associations will be responsible for the provision of petrol and oil outside the camp period, and for the hiring of the cars required by battery staffs.

4. *Annual Camp.*—In order to carry out the decisions (para. 2 (*c*)) regarding the supply of 6-wheelers at annual camp, arrangements for Field Brigades will be made experimentally on a decentralized basis by Commands, on the lines laid down in paras. 5–9 below, which give the general outline of the system which will hold good when all Brigades are mechanized, if the experiment is successful, and para. 21 (*a*) which indicates the particular arrangements for 1931. In view of the smaller number of medium brigades, the W.O. will from the start make arrangements for their camps as laid down in paras. 10 to 13 and 21 (*b*) below.

Field Artillery.

5. The War Office will detail the maximum number of R.A.S.C. 6-wheelers which may be used to supplement unit 6-wheelers during various periods of the summer.[2] Demands for R.A.S.C. 6-wheelers, if required, up to the numbers allotted will be submitted to the War Office (Q.M.G.3.) which will arrange for their supply. Medium 6-wheelers provided under Appendix I, when not required for Medium Brigades under the arrangements of paras. 10–13, will be available for use by the Field Artillery and may be substituted by the W.O. for R.A.S.C. 6-wheelers demanded by Commands.

6. For the purpose of allotment and of normal pooling of unit 6-wheelers (see para. 2 (*c*) ii), Commands will be grouped as follows :—(1) Eastern Command and London District; (2) Northern and Scottish Commands; (3) Southern Command; (4) Western Command.

7. As stated in para. 2 (*c*) ii, unit 6-wheelers will be withdrawn from batteries only after termination of their camp and full use must be made of these 6-wheelers

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[1] Once a vehicle is allotted to a unit it will be earmarked as belonging to that unit, and, although withdrawn for repair or for use by other units at camp, will always be returned to its own unit when no longer required elsewhere.

[2] The number of guns to be used at camp will vary with the attendance at camp in the same way as at present, and the number of 6-wheelers supplied will be adjusted accordingly.

before the R.A.S.C. is called upon to supply any vehicles, even to the extent of altering camp dates where local conditions render this course possible.

The pooled 6-wheelers should normally be sufficient to provide all the needs for 6-wheelers at camp with only very occasional and limited calls on the R.A.S.C. In fact, it is calculated that if, when all units are equipped with 6-wheelers these were "pooled" to the utmost possible extent throughout the whole country demands on the R.A.S.C. for the whole camping period of T.A. Field Artillery units would not exceed the use for one fortnight each of 130 6-wheelers. One test of the success of Command arrangements will be the extent to which calls on the R.A.S.C. can be kept within the limits calculated above.

8. Unit 6-wheelers will be pooled, not only within the Command groups detailed above, but also to the extent that when a unit of one Command attends camp in another Command area, every effort must be made to supply as many as possible of the 6-wheelers required for that unit by the Command in which the camp takes place. Again, the available unit 6-wheelers must be used before those of the R.A.S.C.

9. Apart from this, adjoining Commands which are not grouped will, where possible, co-operate in the use of each others unit 6-wheelers during any part of the period in which they are available for use by other units (see para. 2 (*c*)), and are not employed under paras. 7 and 8 above.

Medium Brigades.

10. Provisional camp programmes for all T.A. Medium Artillery Units proceeding to training camps in any year will be submitted to the War Office not later than 1st November in the preceding year. They will show the proposed place of camp of the unit (which will be settled, as at present, by Commands) but will also give alternative dates for the camp of each unit in order of preference with reasons for their choice. The arrangements for practice camp will be made and notified by War Office direct.

11. In due course an approved programme of artillery camps for Medium Brigades will be issued by the War Office. Every effort should be made to adhere to this programme, but if departure from it is unavoidable War Office approval should be sought at the earliest possible moment.

12. The War Office will then give instructions :—(i) for the necessary transfers of vehicles between T.A. units; (ii) for the supply of additional R.A.S.C. vehicles, if required.

13. When a brigade is likely to go to camp with less than 60 per cent. of its establishment, the W.O. (T.A.1.) should be informed not less than a fortnight before the camp in each case. The probable attendance and reduced number of 6-wheelers recommended should be stated.

Arrangements common to Field and Medium Artillery.

14. *R.A.S.C. vehicles at Camp.*—(*a*) *Maintenance, etc.*—Any additional R.A.S.C. vehicles provided at camp (see paras. 5 and 12 (ii)) will be driven at camp by T.A. personnel, but the Regular R.A.S.C. drivers who convey the vehicles to camp will remain with them, accompanied by proportionate supervisory and artificer personnel for maintenance purposes and to assist the T.A. personnel in the operation of these vehicles. These detachments will also be available for the purpose of assisting T.A. units in the maintenance of their own 6-wheeled vehicles.

(*b*) *Hirings in lieu.*—In the absence of R.A.S.C. vehicles at T.A. camps, a certain amount of hiring of commercial vehicles (normally 4-wheelers) may be necessary in order to carry on normal R.A.S.C. services. These hirings will be permitted only when they are due to the absence of R.A.S.C. vehicles at *camps* of the T.A. (see also Appendix III A, para. 4 (*a*)). If hiring would become necessary owing to the loan of a R.A.S.C. 6-wheeler to a T.A. battery to replace temporarily its 6-wheeler while out of action out of camp, the loan will not take place.

15. *Transfers.*—(*a*) G.Os. C.-in-C. will where necessary arrange for suitable advance parties to take over vehicles transferred both under paras. 7 to 8 and para. 12 (ii) above, either at the camp or H.Q. of the unit previously using them or at any other station where they may be (see para. 15 (*b*) below).

(*b*) Periods may occur during the camping season in which 6-wheelers cannot be employed, although they will be required at camp again ; during these periods Commands will have to decide whether they should return to unit H.Q. or whether it would be more desirable and economical to keep them at another station. This will depend on such considerations as the length of the interval between camps, the distance to unit H.Q., the place of the next camp, etc. If they do not return to unit H.Q. they will be taken over under Command arrangements by a Royal Army Service Corps unit, and held by that unit at the most convenient station (R.A.S.C.) or other) until they are required for attendance at the next camp.

The above provisions do not apply to R.A.S.C. vehicles which will be under the continuous charge of R.A.S.C. personnel.

16. *Conveyance to and from annual camp* will be arranged as follows :—

(i) *Six-wheelers accompanying their own units.*—As at present, by the T.A.A.s concerned.

(ii) *Transferred 6-wheelers.*—Arrangements should, if possible, be made for these 6-wheelers to be driven to camp by road by the advance party provided under para. 15 (*a*), or from camp by a rear party. If, however, this is not possible through distance, etc., the G.O.C.-in-C. will request the Association concerned to make the necessary arrangements for conveyance.

(iii) *R.A.S.C. 6-wheelers.*—Under W.D. arrangements.

(iv) *Guns, Haulage from station to H.Q.*—In no circumstances will 6-wheelers, which are required elsewhere, return with their unit solely for the purpose of hauling guns from the station to H.Q. Arrangements for haulage will be made by Associations. It may be found possible to employ the vans hired for the use of battery staffs on this work.

17. *Advance and Rear Parties.*—Not more than two unit 6-wheelers for a brigade may be used by advance parties and, when not required elsewhere, by rear parties.

18. *Use by Regular Army.*—The 6-wheelers held by T.A. batteries will be available for use by the Regular Army, if required, at manœuvres, etc., provided this does not interfere with arrangements for T.A. camps.

C. Transitory Arrangements, 1931–1932.

(*Paras. 19, 20, 21 dealing with temporary arrangements for the years 1931 and 1932, during which mechanization will be incomplete, are omitted.*)

APPENDIX III.

Financial Arrangements.

A. 1933 onwards.
B. Modifications in 1931 and 1932.

A. 1933 Onwards.

1. When all brigades are completely equipped under Appendix I, financial arrangements under the scheme outlined above will be as follows :—

2. *Grants to Associations.*—The present grants for provision of horses and M.T. at drills, and for hire of 6-wheelers at camps of Field and Medium Brigades, will cease. Associations will draw the following grants :—

(*a*) £24 for each battery for the occasional hire of cars for each battery staff.
(*b*) £20 for each battery for the provision of petrol, oil, etc., at drills, etc.
(*c*) Grants for the hire of battery staff cars at week-end and annual camps.
(*d*) Grants for conveyance of 6-wheelers as laid down in Appendix II, para. 16 (i) and (ii), except that the rules regarding the county limit will not apply.

3. *The T.A. Training Grant* will be charged with the following expenditure :—

(*a*) Pay, etc., of advance and rear parties under Appendix II, para. 15 (*a*) and (*b*).
(*b*) Additional expenditure due to attachment of R.A.S.C. personnel under Appendix II, para. 14.

4. *Other expenditure* :—

(*a*) The cost of any hiring of vehicles by the R.A.S.C. rendered necessary by the absence of R.A.S.C. vehicles at T.A. camps will be charged to Vote 2 (see Appendix II. B, paragraph 14 (*b*)).

(*b*) All other expenditure not specifically referred to above will be charged to normal votes. In case of doubt reference should be made to the W.O. (F.4.).

5. *Establishment Grant.*—The establishment grant for Field and medium horsed batteries at present includes provision for insurance of horses provided for these units against loss or injury. This amounts to £20 in the grant for a field battery and £25 in that for a medium battery, the total amount involved being some £5,400. When the new arrangements outlined in the letter come into force, expenditure on this service will no longer be necessary as the War Department accepts responsibility for damage to the 6-wheelers provided and the grants would fall to be reduced accordingly. It has, however, been decided that this reduction will not be made, thus in effect increasing the establishment grants by the above amounts.

B. 1931–1932.

(*Paras. 6 and 7 dealing with the temporary situation which will exist during these two years are omitted.*)

DOMINION FORCES

Regimental Alliances.—The King has approved of the following alliances :—

The Mississauga Horse, Non-Permanent Active Militia of Canada, to the 1st King's Dragoon Guards.

Queen Alexandra's (Wellington West Coast) Mounted Rifles, New Zealand Military Forces, to the 14th/20th Hussars.

Australian Army Veterinary Corps to the Royal Army Veterinary Corps.
The 57th Battalion Australian Infantry, Australian Military Forces, to The Middlesex Regiment (Duke of Cambridge's Own).

INDIAN ARMY

COLONELS COMMANDANT.—The King has approved the introduction, in very special cases, of the appointment of distinguished officers as Colonels Commandant of Indian infantry regiments. The following appointments have accordingly been notified in the *London Gazette* :—Field-Marshal Sir William Birdwood to be Colonel Commandant of the 13th Frontier Force Rifles ; Brigadier-General G. M. Baldwin, Indian Army, retired, to be Colonel of The Guides Cavalry (10th Q.V.O.F.F.), and of the 5th Battalion (Q.V.O. Corps of Guides) 12th Frontier Force Regiment.

NEW CHIEF OF STAFF.—The India Office announces that the appointment of Lieutenant-General Sir Kenneth Wigram, K.C.B., C.S.I., C.B.E., D.S.O., as Chief of the General Staff in India, in succession to Lieutenant-General Sir Cyril J. Deverell, K.C.B., K.B.E., with effect from March 21st, 1931, has been approved.

FOREIGN

AFGHANISTAN

INTERNAL SITUATION.—There has been no material change in the situation.

Movements of troops towards Gardez and Ghazni were reported during June, and although there are rumours that the Suleiman Khel were causing trouble, no confirmation has yet been received.

Raiding gangs were still active in Koh-i-Daman at the beginning of June, and troops were despatched from Kabul to clear up the situation in this area.

BELGIUM

LINGUISTIC LAW.—Instructions have now been issued by the Minister of National Defence for the application of the linguistic law in the army.

Instruction will be given entirely in the official language of the unit concerned. Commands within the company, squadron, battery, etc., will be given in the official language of the unit. In larger units, e.g., the battalion, commands will be given in French. French will be used in all official communications between officers of the active army. Flemish will be used in all official communications with subaltern officers of the reserve who have received their instruction in this language, unless they express a wish to use French.

It is noteworthy that there will be three German speaking units in the Belgian Army, a company of infantry at Eupen, a transport company at Elsenborn, and one battery of the 3rd Regiment of Artillery.

UNIFORM.—By Royal Decree a new full dress uniform has been approved for the officers of the Belgian Army.

The uniform will be dark blue, with various coloured and gold ornaments. A blue forage cap will be worn.

FRANCE

ADOPTION OF NEW RECRUITING LAWS.—1. A Presidential Decree of 20th June, 1930, confirms the official adoption of the most important principles of the one year's service law for the army annual contingent, as regards length of service with the colours and in the reserve. The first contingent to be affected is the class incorporated in October, 1929, which will therefore complete its colour service in October, 1930, and subsequently according to the actual dates of enlistment.

2. According to the *rapport* preceding this decree the number of professional non-commissioned officers and men, i.e., *de carrière*, which has been laid down as the minimum necessary prior to the implementation of this new law, will be reached by that date. It should be noted in this connection that after October any man with a day over one year's service comes into the category of *carrière*, a fact which somewhat diminishes the potential military value of a considerable proportion of those serving under this appellation.

3. At the same time the incorporation of the annual contingent will occur at the age of twenty-one instead of twenty. This is the other change essential to the official adoption of the new service law.

PROFESSIONAL CADRE.—The following is stated to be the situation regarding the number of *militaires de carrière* who will be available in the French Army on 1st October, the date on which the one year's service law will be officially adopted :—

A.—1. Effectives with service over the legal period on 1st June, 1930	100,050
2. Men serving on a voluntary engagement who will fulfil this condition between 1st June and 30th September, 1930	9,370
3. Probable re-engagements during period in (2)	2,400
4. Probable losses during period in (2)	4,400
Total *militaires de carrière* on 1st October, 1930	107,420
Add :	
1. Men serving on voluntary engagements, but not having attained legal period of service by 1st October ..	9,340
2. Probable engagements—1st June to 1st October	4,640
Total serving on voluntary enlistment basis	121,400

B.—It will be remembered that 106,000 is the maximum total of *militaires de carrière* called for as one of the safeguards prior to the official adoption of this new law.

AGE LIMIT FOR THE RETIREMENT OF OFFICERS.—1. A *proposition de loi* has recently been laid, increasing the age limit for retirement of officers. The accompanying table shows the ages of retirement in 1914, to-day, and in future if this measure is adopted.

2. The reasons given for the necessity of the new law are :—

(*a*) Officers should not have to retire earlier than civil functionaries. These latter do not retire till fifty-five.

(*b*) With only one year between the retiring age of lieutenent-colonels, colonels, and generals of brigade, it is claimed that many highly qualified officers miss promotion altogether, and many others have to retire very shortly after promotion; this means that higher commanders are replaced too frequently for efficiency.

	1914.	*To-day.*	*New proposals.*
2nd Lieutenants	51	51	55
Lieutenants	52	52	55
Captains	53	53	55
Majors	56	56	57
Lieutenant-colonels	58	58	59
Colonels	60	59	61
Generals of Brigade	62	60	63
Generals of Division	65	62	65
Maintained without limit	70	—	—
Regional Commanders	—	—	66
Members of *Conseil Supérieur*	—	65	67
Vice-President of *Conseil Supérieur* ..	—	—	68

MOROCCO

FRENCH ZONE.—*Operations in the Western Atlas.*—On the 18th and 19th June an advance of about 12 kilometres was made in the region of the Oued-el-Abid with a view to assuring the safety of the road between the posts of Arbala and Skiba (Western slopes of Atlas). The operation was completely successful and the line now held runs Taourirt—Tini—Tanout—Oudrouz. The forces engaged consisted of some four battalions (including two of Foreign Legion), three batteries, one cavalry regiment, and 2,000 to 3,000 native *partisans*, these operated in three columns. The advance appears to have met with no opposition.

Unified Command on Algero-Moroccan Frontiers.—A recent Army Order lays down the organization of the new command on the Algero-Moroccan frontier.

The troops will consist of :—

A.—Such Moroccans as are designated by the G.O.C. Morocco.

B.—The following Algerian troops and services :—

(i) *Infantry.*—One battalion of 1st Foreign Legion.
One battalion of 2nd Regiment Algerian *Tirailleurs.*
[1]*Groupe franc* of 2nd Regiment Algerian *Tirailleurs.*
Mounted company of the 1st Foreign Legion.
Disciplinary Company of the 1st Foreign Legion.
Section d'épreuve of the Algerian Division.
Section of 80 mm. guns of the 1st Foreign Legion.

(ii) *Cavalry.*—A group of squadrons of the 2nd *Spahis.*
A mechanized squadron of the 1st Foreign Legion Cavalry.

(iii) *Train.*—A mixed company of the 28th Squadron.

(iv) *Engineers, Intendance, R.A.M.C.*—All detachments stationed in the district of Colomb, Saoura, and the post of Beni-Ounif.

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[1] A *groupe franc* is a very mobile force, probably of about a company, ready to move off in any direction at any moment.

(v) *Aviation.*—A squadron of the 2nd African Aviation group.

(vi) *Saharan troops.*—Staff and R.T. Section of the Western Group of Saharan Companies.
Saharan Motor Detachment.
Saoura Saharan Company.

(vii) *Auxiliary forces.*—*Maghzens* of Béchar, Ziusfana, Guir and Beni-Abbès.

PERSIA

TRANS-PERSIAN RAILWAY.—On 24th February, 1927, the Majlis passed a law authorizing the Government to construct a railway from Bandar-i-Shah on the Caspian Sea, to Bandar-i-Shahpur on the Persian Gulf, *via* Tehran and Hamadan. Construction work was to be started simultaneously from each end, and the initial estimate of cost was about £15,000,000, to be spread over a period of twelve years.

On 19th April, 1928, a Railway Survey Bill was passed authorizing the Government to contract with a German-American Consortium for the survey and construction of 150 kilometres of line at each end. The German group was to work from the North, and the American (Ulen & Co.) from the South.

Work was started in the South in February, 1929, and at a later date in the North, owing to weather conditions. By February, 1930, the line from Bandar-i-Shah to Aliabad, a distance of 62 miles, was finished, except for a small section near Aliabad and final work on the bridge over the Tajan river. In the South the line from Bandar-i-Shahpur to Dizful, a distance of 156 miles, was also completed. The gauge of this railway is normal, and thus does not conform to either the Russian or Iraq gauge.

Owing to floods, however, washouts on a large scale occurred in several places on the southern section, and the Persian Government endeavoured to force the Syndicate to repair the line before they would take it over. Negotiations were entered into between the Consortium and the Persian Government, but as no agreement could be reached, the contract between the two parties was cancelled with effect from 13th May. From this date the lines were taken over by the Persian Government.

The Railway Consortium has now been dissolved, and the two Syndicates have come to an agreement by which either is free to enter into a new contract with the Persian Government, but not to trespass on the other's area without mutual consent. It is understood that the American group in the South will not attempt to obtain a further contract in Persia, but that the Germans will continue in charge of the northern section.

No information is at present available as to the future policy of the Persian Government regarding the completion of the line across Persia.

SPAIN

SPANISH ARMY.—*Regulations for promotion.*—The *Gaceta* of 10th June published the new regulations regarding qualification for promotion in the Spanish Army.

The general particulars are given below :—

1. *Confidential Report.*—The primary qualification for promotion to any higher rank is a satisfactory report.

2. *Qualifications.*—Qualifications in the various ranks necessary for promotion to the next highest grade are as follows :—

(i) *2nd Lieutenant* (*Alferez*).—Must have completed two years on the Active List.

(ii) *Lieutenant.*—For promotion to captain officers must have a total of seven years' service of which five years must have been on the active list as lieutenant. Of these five years, three must have been served in the particular branch of the service.

(iii) *Captains :—*

(*a*) Must have three years' service in the rank.

(*b*) Should have passed the course for promotion. Two subsequent attempts are allowed in case of initial failure to pass a course.

(iv) *Majors.*—Three years' service in the rank on the Active List.

(v) *Lieutenant-colonels.*—Six years' service on the Active List are required before promotion to colonel. Of these six years, service in the rank of major may be taken into account, but a minimum of two years of lieutenant-colonel is also necessary.

(vi) *Colonel.*—Promotion from the rank of colonel upwards is governed by a special Classification Board which is responsible for setting the necessary promotion courses.

In order to be qualified for promotion colonels must :—

(*a*) Be physically fit.

(*b*) Have served at least three years in the rank on the Active List.

(*c*) Pass the required course for promotion and have shown themselves professionally efficient during their service.

(vii) *Brigadiers and Major-generals.*—Promotion of officers holding these ranks will be by selection from those qualified. They must be among the first third of their rank and have had two years' service on the Active List in each grade before promotion to higher rank.

AIR NOTES

ROYAL AIR FORCE

H.R.H. The Prince of Wales.

Group Captain H.R.H. The Prince of Wales, K.G., K.T., K.P., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., G.B.E., Personal A.D.C. to the King, has been promoted to the rank of Air Marshal, to date 1st September, 1930.

Air Council.

Air Vice-Marshal H. C. T. Dowding, C.B., C.M.G., has been appointed a Member of the Air Council as Air Member for Supply and Research, in succession to Air Marshal Sir John F. A. Higgins, K.C.B., K.B.E., D.S.O., A.F.C., who has retired at his own request, to date 1st September, 1930.

Appointments.

Air Vice-Marshals.—Sir Robert Brooke-Popham, K.C.B., C.M.G., D.S.O., A.F.C., to be Commandant of the Imperial Defence College, to date 1st January, 1931; E. R. Ludlow-Hewitt, C.B., C.M.G., D.S.O., M.C., to Headquarters Command, Iraq, pending taking over from Sir Robert Brooke-Popham, to date 2nd October, 1930.

Air Commodore.—P. B. Joubert de la Ferté, C.M.G., D.S.O., to be Commandant R.A.F. Staff College, to date 22nd September.

Group Captains.—J. B. Bowen, O.B.E., to No. 3 Flying Training School (I. Area), in command, 15th July; R. E. C. Peirse, D.S.O., A.F.C., to Headquarters, Coastal Area, for Air Staff duties, 16th June; H. L. Reilly, D.S.O., to Headquarters, Fighting Area (A.D.G.B.), for Air Staff duties, on completion of Senior Officers' War Course, 26th July; A. H. Jackson to Headquarters, Coastal Area, supernumerary, for course of instruction in flying boats, 15th July.

Personnel.

Flying Training.—Since 1st June, 1930, the following have completed courses at the Flying Training Units:—

Flying Instruction Course.

	Officers.	*Airmen.*
Central Flying School	19	2
	(including 2 foreign officers)	

"Ab Initio" Courses.

No. 1 Flying Training School ..	23	9
No. 2 Flying Training School ..	25	7
No. 3 Flying Training School ..	2	—
No. 4 Flying Training School ..	11	21
	(including 3 foreign officers)	
R.A.F. College	21 (Cadets)	

General.

R.A.F. Display.—The annual R.A.F. Display was held at Hendon on 28th June. The Display was very successful, and a large number of spectators

watched the proceedings. It was possible to re-introduce into the programme the new type aircraft park, and fly past of experimental types. Both these events proved to be very attractive.

AIR EXERCISES.—The Air Defence of Great Britain Air Exercises took place between the 12th and 15th of August. The object of these Exercises was to train the staffs and units of Air Defence of Great Britain in the type of operations in which they might be engaged in a campaign overseas against a civilised enemy equipped with aircraft, as opposed to the very special problems of home defence, which have formed the basis of the Air Exercises in past years. It will be some time before all the information obtained as a result of these Exercises has been collated and digested. It is clear, however, that the major object of giving valuable experience to the staffs and units engaged in the Exercises has been attained.

ARMY CO-OPERATION (HOME).

During the period ending 31st August, all Army Co-operation squadrons were engaged on a full programme of collective training and co-operation with the various Army Commands.

Officers of these squadrons attended numerous Army staff exercises, and many Army officers, N.C.O's and men were given air experience flights at the squadrons' aerodromes.

Air co-operation, involving close reconnaissance, artillery reconnaissance, photography, and low flying attacks, was provided at the majority of battalion, brigade, and divisional training exercises. Aircraft were also provided to co-operate with artillery at the R.A. Practice Camps at Okehampton, Larkhill, Tilshead, Redesdale, and Buddon, and many live shoots were carried out successfully with air observation.

During the annual O.T.C. camps, aircraft co-operated in various schemes and field days, in some of which over 3,000 Cadets took part on each side. Demonstrations of all types of aircraft were arranged, and a total of over 1,500 Cadets were given flights. In addition to the work of this kind done by the squadrons, a special flight was formed temporarily at Netheravon to co-operate with the camps at Tidworth.

NAVAL CO-OPERATION.

(*See* NAVY NOTES, *page* 841).

OVERSEAS COMMANDS

INDIA

Since the end of April six squadrons of the Royal Air Force have been actively employed on operations on the North West Frontier of India. The country over which these operations have been carried out extends along the whole tribal territory from Waziristan to Malakand. In one part or another of this wide area operations have been practically continuous since the end of April, during which period the Royal Air Force has been called upon to assist in dealing with hostile tribes and lashkars, whose activities, unless suppressed with despatch, would undoubtedly have spread and caused a very serious situation.

During the period under review the climatic conditions have been very trying, as the operations have taken place during the height of the hot weather season.

AVIATION IN FOREIGN COUNTRIES

FRANCE

PROPOSED MODIFICATIONS TO THE AIR FORCE ORGANIZATION LAW.—The Projet de Loi submitted by the French Government to the Chamber of Deputies has now been examined by a Commission appointed by the Chamber. After an exhaustive examination of the situation of France from the air point of view, and an examination of the air organization of the more important air Powers, the Commission recommends numerous modifications to the Projet de Loi put forward by the Government. The more important modifications are as follows :—

(*a*) Article 5 now reads :—

" The Air Forces are organized so as to provide :—

(i) An independent formation known as the ' Reserve Generale d'Aeronautique.'

(ii) Air formations for co-operation with the army.

(iii) Air formations for co-operation with the navy.

(iv) Air formations stationed in the colonies."

The Commission adds the following note :—

" In reversing the order in which the various elements forming the Air Forces are mentioned, the Commission intends to draw attention to the importance which it attaches to the creation of a powerful independent Air Force. It will be noticed that the term ' Reserve Generale d'Aeronautique ' has been used to replace the term ' Reserve Generale d'Aviation.' The new term includes balloons and lighter-than-air craft."

(*b*) As originally drawn up by the Government, Article 6 placed the air forces detailed for co-operation with the army and navy permanently at the disposal of those Services for tactical training and training in liaison with the Service concerned. The Commission proposed to amend the Article in such a way that the air forces detailed for co-operation with the army or the navy are placed at the disposal of those Services only for exercises and instructional manœuvres carried out in actual co-operation with the army or the navy.

(*c*) The original proposal of the Government for the division of France into air zones, proposed to make the air zones conform to the grouping of the army or navy zones. It is now proposed that the air zones shall be organized without regard either to army or navy zones.

(*d*) Article 31 is modified to bring the Fleet Air Arm technically more under the control of the Air Ministry. The Commission adds a note that the maintenance of the absolute independence of the Air Forces embarked in ships would be contrary to the principles which have governed the creation of an Air Ministry.

The result of the modifications by the Commission will be to make the Air Ministry much more independent of the army and the navy than would have been the case if the proposals of the Government had been passed unmodified.

The proposals of the Chamber Commission have still to be approved by the Chamber of Deputies.

AIR MANŒUVRES AT LYONS.—Air exercises were carried out over Lyons on the 29th July for the purpose of testing the possible means of defence of the city against attack by aircraft armed with incendiary and gas bombs.

The first part of the exercise was carried out in the afternoon. The enemy, represented by fighter and bomber squadrons of the 35th Aviation Regiment, coming from Grenoble attacked on several sides in successive waves at an average altitude of 4,000 and 5,000 feet. They were quickly located by sound, and as soon as they were seen the A.A. batteries opened up a barrage.

The night attack was carried out by separate units, some coming from Grand Camp, others from Amberieu. Both civil and military elements had been co-ordinated for the defence. Between 10.0 and 11.0 p.m. the town was plunged in partial darkness and the fire brigades were called out to extinguish imaginary fires, while in the western quarters of the town, measures for protecting the population were carried out with the assistance of the police. At the same time the alarm was given to the batteries of the inner forts. Sixteen aircraft were signalled by the look-out stations; others which arrived much later, flying at an altitude of over 10,000 feet, were not located. Searchlights were used as part of the defence.

At the conference held after the exercise, the following conclusions were reached :—

(1) That the A.A. defence at Lyons as at present organized is inadequate to protect the town against a mass air attack.
(2) That in the event of attack, the bulk of the population must be evacuated.
(3) That gas masks, and possibly gas proof clothing, can only be issued to those who are obliged to remain in the town.

PURCHASE OF SHORT CALCUTTA FLYING BOATS.—Two additional Short Calcutta flying boats have been ordered by the French Government. The first of this type delivered by Messrs. Short Brothers in September, 1929, has given the utmost satisfaction, and has led to the new order. The flying boats will be built under licence by the firm of Breguet.

TOURS TO FOREIGN COUNTRIES.—During the past three months French Air Service Squadrons have visited the following countries :—Bulgaria, Greece, Rumania, Poland, Estonia, Portugal and Yugo-Slavia.

GERMANY

CELEBRATION FLIGHT OVER THE RHINELAND.—The Deutscher Luftfahrt Verband organized a circular flight by aircraft over the liberated territory of the Rhineland in commemoration of the evacuation by ex-allied forces. Eighty-five aircraft took part in a circular tour between 4th and 7th July. Starting from Cologne the aircraft passed over Bonn, Coblenz, Wiesbaden, Mainz, Worms, Neustadt, Kaiserslauten, Trier, Aachen, Essen, Düsseldorf, finishing at Cologne.

The airship Graf Zeppelin and the large four-engined Junkers aeroplane " G.38 " also visited Cologne and took part in the celebrations.

INTERNATIONAL FLIGHT ROUND EUROPE.—The 7,500 mile round Europe flight for light aeroplanes, organized by the German Aero Club, was completed in July, when the majority of the competing aircraft had arrived back at Berlin. Captain H. S. Broad, flying a Gypsy engined Moth, finished first, and was the only competitor to obtain full marks for speed and reliability.

The flying test for speed and reliability carried a possible 270 marks out of a total of 500; the remainder being awarded for landing, take-off, and technical

tests, which took place at Templehof aerodrome, Berlin, during the following days.

The final placings were as follows :—

1st	Pilot Morzik (German).	Aircraft and engine	B.F.W. M23c, 80/100 Argus.
2nd	,, Poss (German).	,,	Klemm L25e, 80/100 Argus.
3rd	,, Notz (German).	,,	Klemm L25e, 80/100 Argus.
4th	,, Spooner (British).	,,	D.H. Moth, 100/120 Gipsy 11.
5th	,, Polte (German).	,,	B.F.W. M23c, 80/100 Argus.
6th	,, Carberry (American).	,,	Mono Special, 110 Warner.
7th	,, Von Massenbach (German)	,,	B.F.W. M23c, 72/89 Siemens Sh. 13.
8th	,, Broad (British).	,,	D.H. Moth, 100 Gipsy.
9th	,, Kruger (German).	,,	B.F.W. M23c, 80/100 Argus.
10th	,, Dinort (German).	,,	Klemm L25e, 80/100 Argus.

Twenty-one others also competed.

ITALY

THE SCHNEIDER CUP CONTEST, 1931.—The controversy between the Royal Aero Club of Italy and the British Royal Aero Club, as to the conditions under which entries for the 1931 contest are to be accepted, is still continuing, and no settlement has as yet been reached.

Italy intends to enter three aircraft for the race, and it is understood that experiments are being carried out with the same type of aircraft as those used in last year's race, and also with a Piaggio-Pegna seaplane, which was designed primarily for an attempt on the speed record.

ROME-ATHENS DIRECT AIR LINE.—It is rumoured that a direct air route between Rome and Athens is likely to be inaugurated in the near future, and that Dornier flying boats carrying 100 passengers will be used on this service.

EXPERIMENTAL TYPES OF AIRCRAFT AND ENGINES.—The Fiat firm have succeeded in producing a heavy oil engine for use in aircraft which has so far given excellent results in service. Several fairly long flights have been made, including one from Turin to Rome on the occasion of the Italian Air Display in June.

A new helicopter designed by Signor D'Ascanio was also on view at the Display, and made a short flight. This helicopter can leave the ground vertically without any run, and in the event of engine failure can descend perpendicularly, and is fitted with three propellers enabling it to fly in any direction. It is believed that all flights made to date have been of brief duration, and the helicopter is still decidedly in the experimental stage.

JAPAN

As a result of the London Naval Conference, Japanese Press reports state that the Chief of Staff is considering the establishment of thirteen new Naval Air Squadrons, which will bring the total up to thirty.

Admiral Kanji Kato, the former Chief of the Naval Staff, prior to relinquishing his post in June, 1930, is reported to have advocated the creation of twenty new

air squadrons, whilst the Japanese Government are now credited with the appointment of a Commission to consider the eventual expenditure of £20,000,000 on sixteen new squadrons, and provision of a hundred seaplanes for use on warships.

SOVIET RUSSIA

With the exception of the Moscow-Berlin and Leningrad-Berlin routes, which are operated by the German-Russian Company, Deruluft, all air routes in the U.S.S.R. are now operated by the state-controlled air traffic Company Dobroliot. Before 1925, a number of small companies existed in various parts of the U.S.S.R. As civil aviation became more organized, all the smaller companies either went out of business or became absorbed into the two largest companies, Dobroliot and Ukrvozdukhput. Since 1925, these two companies, together with Deruluft (mentioned above), have been the only air traffic companies in the U.S.S.R. The recent merging of Ukrvozdukhput into Dobroliot, together with a recent reorganization of the Soviet Government Department which controls civil aviation, afford evidence that the value of organized air routes in a vast country like Russia, with its poor land communications, is fully recognised.

UNITED STATES

U.S. AIRCRAFT PRODUCTION.—In the first six months of this year the number of civil aircraft produced in the United States is estimated to be 971. Military aircraft delivered during the first five months of the year totalled 279

AIRSHIP NOTES

GREAT BRITAIN.

Loss of " R.101."

The airship " R.101 " set out from Cardington at 7.30 p.m. on 4th October bound for Karachi. Passing over London at about 9 o'clock, she left the English coast in the vicinity of Hastings at 10.35 p.m. It was then raining hard and there was a strong south-westerly wind. According to a wireless message from her at 10.47 p.m., the ship was at that time behaving well generally, and had recovered water ballast. At 12.36 a.m. a signal was received saying that " R.101 " was crossing the French coast at Point de St. Quentin, and at 1 a.m. her position was reported South-West of Abbeville. The average speed made good up to then had been only 33 knots. The airship also reported that she was flying at 1,500 feet in intermittent rain and cloud ; all essential services were stated to be functioning satisfactorily. At 1.8 a.m. the last formal message was received at Croydon, thanking that station for their valuable assistance, and saying that they would not be required further that night. Croydon replied to say that they were remaining on watch. After this, and almost up to the moment of the disaster, routine signals regarding the strength of wireless messages were exchanged and are reported to have been strong in both directions.

At about 2 a.m., when near Beauvais, the airship appears to have dipped suddenly at a steep angle and struck the crest of a hill ; the fore part immediately caught alight, and the fire spread rapidly towards the passenger quarters and crew space.

Of the total complement of 54, passengers and crew, 46 lost their lives and two succumbed to their injuries later. Amongst the casualties were : Brigadier-General Lord Thomson, Secretary of State for Air ; Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation ; Wing Commander R. B. B. Colmore, Director of Airship Development ; Lieutenant-Colonel V. C. Richmond, Assistant Director of Airship Development ; Major G. H. Scott ; Major P. Bishop ; Squadron Leader F. M. Rope ; Flight Lieutenant H. C. Irwin, Captain of the airship ; Squadron Leader E. L. Johnston, navigating officer ; Lieutenant-Commander N. G. Atherstone ; Flying Officer M. H. Steff ; Mr. M. A. Giblett ; Mr. A. Bushfield ; Squadron Leader W. H. L. O'Neill ; Squadron Leader W. Palstra. No officers were saved.

The most practical sympathy was shown by the French authorities in caring for the dead and assisting the injured.

Forty-seven coffins were conveyed from Boulogne to Dover in H.M.S. " Tempest " ; the body of the last victim, who succumbed to his injuries, followed later. On 10th October a Memorial Service was held in St. Paul's Cathedral, and was attended by H.R.H. The Prince of Wales, representing the King ; the Prime Minister, and other members of the Cabinet ; the Prime Ministers and members of the Delegations attending the Imperial Conference ; and a large number of Peers, Members of Parliament and representatives of Government Departments. Meanwhile the bodies of the victims lay in state in Westminster Hall. On 11th October the coffins were taken from Westminster Hall to Euston Station, the funeral procession including members of the Government and repre-

sentatives of the three Services. The same afternoon the victims of the disaster were all buried in the same grave at Cardington, close to the airship station from which " R.101 " set out just one week before.

On 23rd October it was announced that Lord Amulree, the new Secretary of State for Air, had appointed Sir John Simon to hold an enquiry into all the circumstances of the disaster. Lieutenant-Colonel J. T. C. Moore-Brabazon and Professor C. E. Inglis were nominated as his assessors. The enquiry was opened on 28th October at the Institution of Civil Engineers.

" R.100's " Transatlantic Flights.

" R.100 " left the mooring mast at Cardington at 3.48 a.m. on 29th July and arrived at Montreal at 5.33 a.m. (Eastern standard time), having crossed the Atlantic in record time for an airship. The whole journey occupied 79 hours, 8 hours of which were spent cruising at a much reduced speed to effect temporary repairs to the fabric.

While over the St. Lawrence, the night before her arrival, " R.100 " encountered a severe storm, during which the ship was controlled with difficulty between 1,500 and 4,000 feet ; but, except for superficial damage to the fabric, she weathered the storm very satisfactorily.

There were 44 passengers on board, and the airship also carried 10,440 gallons of fuel and 5.4 tons of ballast.

On 10th August, 1930, " R.100 " made a flight in Canada of 25½ hours duration, when the airship passed over Ottawa, Toronto, Hamilton, Niagara Falls, Lake Ontario and Kingston. Just prior to mooring at St. Hubert the reduction gear of one of the engines was damaged, but in order not to postpone the date of the return flight it was decided that " R.100 " should return to Cardington using five instead of six engines.

The return transatlantic flight commenced at 2.38 a.m. on 14th August, 1930, and occupied a period of 57½ hours, from the time of slipping from the mooring tower at St. Hubert to the actual mooring at Cardington.

The airship carried 56 persons on this flight, including 13 passengers, 9 of whom were British and Canadian Press representatives. There were also on board 9,585 gallons of fuel, 6.3 tons of ballast, and 1.5 tons of drinking water.

" R.100 " has up to date flown 296 hours.

Trans-Atlantic Flights.

In contrast with the numerous accidents to airships, culminating in the loss of " R.101 " when flying over land, it is of interest to note their successes in trans-oceanic flights. The Atlantic has now been crossed ten times : five times in each direction. In 1919 the British airship " R.34 " flew to America and back ; in 1924 the " Los Angeles (L.Z. 126) " flew from Friedrichshaven to Lakehurst, U.S.A. ; in 1929 the " Graf Zeppelin " crossed and re-crossed the Atlantic three times in the month of August : once from Friedrichshafen to Lakehurst, and twice in the opposite direction, the last of these flights being part of her successful trip round the world, when she also crossed the Pacific. In May of 1930 the " Graf Zeppelin " crossed the South Atlantic from Seville to Pernambuco, and having made her way North to Lakehurst, re-crossed ten days later to Seville ; lastly there have been the flights of " R.100."

Every airship which has attempted to cross the Atlantic has succeeded.

GERMANY

Since the publication of last quarter's notes, the " Graf Zeppelin " has made another flight over the British Isles. In the course of a 48 hours' cruise she visited the East coast of Scotland and the North East coast of England on 11th June. The airship passed over the Faroe Islands and the Orkney Islands and then proceeded via Aberdeen, the Firth of Tay and Edinburgh to the neighbourhood of Hull, whence she flew eastward, passing over Holland on her way back to Friedrichshafen.

UNITED STATES

There is every indication that the development of airships in the United States will not be set back by the disaster to the British " R.101," and that the construction of the two large naval airships will proceed according to plan.

Proposals have been made to raise the embargo on the export of helium gas, so as to enable foreign countries, and Britain in particular, to use airships in greater safety.

REVIEWS OF BOOKS

NAVAL

Maritime Trade in War. Lord Eustace Percy. (Oxford University Press.) 6s. od.

Some half dozen lectures, delivered by the author, are reprinted in this small volume. The subject is of unusual interest at a time when all questions of international law may be said to be in the melting pot of the League of Nations. Ably and exclusively discussed, from a standpoint of international jurisprudence, an insight is presented into the formidable difficulties which national prejudices create for representative statesmen at international conferences and conventions.

The present state of international law is complicated and confused because its doctrines are inheritances from the past. The origins of some of these are political, others are legal, others are merely expedients that satisfied particular cases. They are popularly expressed in catch phrases, such as " closed seas," " neutral rights," " enemy character," " blockade," " contraband," " continuous voyage," " freedom of the seas," and so on.

Lord Eustace Percy examines at length the legislation intended to promote arbitration, or to render war impossible, which has been subscribed to in various international deliberations. It is common knowledge that all pacts and covenants ultimately depend upon force to implement them. Further, most have been signed with reservations or abstentions.

Under " Blockade and Contraband " it is pointed out that the British Government did not declare a blockade of Germany, but resorted to Orders in Council for the establishment of the most effective control of world trade that has yet been witnessed. The reason for this course was that blockade is a weapon only wholly effective against an insular nation.

Emerging clearly from these lectures is the fact that in the determination of rules of international law, none among the nations concerned are more vitally interested than the British Commonwealth and the United States of America. It is suggested that these two world Powers should openly establish an organization to discuss and arrive at a formal declaration of their views. As a result of such proposed investigation, the author envisages a fresh start in the domain of international law, and he advances possible solutions which are well worthy of attention. Briefly stated, they imply that all trade with belligerents will be subject to effective concerted control by the neutral nations. The proposal is acutely controversial. Private interests and political policy are intensely unstable factors, liable to explode in popular clamour. Nations are not yet composed of international jurisprudents.

The Royal Navy. By Geoffrey Parratt. (The Sheldon Press). 7s. 6d.

Quotation from the introduction will best explain the author's purpose. He says " This book has been written in the hope that it may show some of the present generation what the Navy has meant to the British Empire from the earliest days and throughout the Great War." Mr. Parratt commences with an explanation of the general principles of naval warfare, which he follows with a short epitome of the history of the Navy. Progress and invention as applied to naval construction, armaments and propulsion are dealt with in chapters on " The Development of the Modern Navy "; " Naval Weapons "; and " Types of Modern Ships and their Functions." With the aid of diagrams illustrating conventional formations the author explains simply " Some Principles of Battle-fleet tactics." His final pages are devoted to a condensed account of the principal naval events of the Great War. These are impartially related in general outline and, in the case of the Battle of Jutland, with somewhat fuller detail.

In his foreword, Admiral Harper underlines the importance of sea power to the Empire, and makes some interesting remarks on the Navy's task of preserving open our sea communications in war.

The immensity of the field covered in this small volume is so great that in this fact lies its handicap. Drastic summarization is imposed on the author, so that to some extent much of his work becomes an affair of headlines and definitions. As a study of a subject of general interest, designed for popular consumption, the book merits attention. It is attractively illustrated, not too technical and plainly worded.

Naval Reminiscences, 1868-1891. By Admiral Crawford Conybeare. (Printed for private circulation).

Admiral Conybeare carries us back to the final years of the masted ships. His first experience of sea life was in the " Liverpool," frigate, flagship of the Flying Squadron during a cruise round the world. In compiling these memoirs he has drawn extensively on old letters and journals. Not a great deal in them varies from the ordinary round of service that now falls to officers in their careers. By far the most interesting years were those which he spent with the Nares Arctic Expedition (1875-6), and at Suakin (1884), where he was in the thick of the fighting of the actions at El Teb and Tamai. He has much of interest to relate of these experiences, which resulted on both occasions in the substantial reward of early promotion. Though separated by several years, the contrast afforded in his narrative of scenes laid in Arctic snows and those on the burning sands of the Red Sea is most striking.

At a time when the torpedo was a recent addition to naval armament, he was among the first officers to qualify as a specialist in torpedo duties. Unlike most authors of similar reminiscences, Admiral Conybeare has but few anecdotes to retail, and equally unlike many chroniclers he refrains entirely from critical comment on the personalities encountered.

Most disarmingly he repudiates any claim to literary pretensions, being content to set down, without recourse to picturesque descriptive phrases, a plain running record of life as he found it. Taking it all in all, it is easy to conclude that he enjoyed to the full his share of adventure and good times afloat and ashore during a period when the Navy was not so strenuously engaged in training for war.

MILITARY

Liaison, 1914. A Narrative of the Great Retreat, 1914. By Brigadier-General E. L. Spears. (Heinemann). 25s. od.

This book is not only "a definite and new contribution to our knowledge" of the opening period of the war, as Mr. Churchill says in his Preface, but is written in a most attractive style. Brigadier-General Spears, in 1914 and until 1917, was liaison officer between G.H.Q. and the French Army on its right; he was, by virtue of his office, often behind the scenes, and he seems to have a most retentive memory for what he saw and heard. His book of 600 pages, except for about forty of them in which are discussed "What made the victory of the Marne possible," "Episodes of the Battle of the Marne" and the "Bombardment of Rheims and the end of the advance," deals with a period of just over one month, 2nd August—5th September: the eve of the Marne. It is made up of three distinct elements of different value: his personal reminiscences, hearsay, and military history founded mainly on the French official account, which at present also ends on 5th September.

The personal part is admirable; it holds us from the opening scene on 2nd August at the Ministère de la Guerre in Paris:—"The room was small, stuffy and gloomy. The low ceiling was dirty, and the pigeonholes lining the wall full of dust"—down to the description of the dramatic appeal of General Joffre on 5th September to Sir John French for British co-operation in the battle of the Marne, with its pathetic ending: "Monsieur le Maréchal c'est la France qui vous supplie." The author brings out the clash of personalities, and shows how the dislike which Sir John French and General Lanrezac took for each other, accentuated by their ignorance of each other's language, was an important item in their failure to co-operate. We find Lieutenant Spears, as he was then, going far beyond his duty in his endeavour to remedy what he vividly describes as "The disastrous state of affairs whereby the Allied armies withdrew by uneven jerks, exposing each other to the enemy's blows and uncovering each other's flanks."

There are neat little sketches of personalities, e.g., Monsieur Poincaré—"small, square and precise . . . The squareness of jaw, which was not concealed under his small, thin pointed beard . . . his eyes set close together, spoke of obstinacy . . . his turned-up nose seemed to convey a challenge."

The hearsay element—matter derived from friends—is also of much interest. We get such items as Sir Henry Wilson's order to the B.E.F. to burn its baggage, load up its lame ducks on the transport, and leg it to the coast; and an account of the circumstance in which G.H.Q. bolted from Dammartin, leaving dinner on the table.

The third element, the historical one, derived from books, will probably be found by many too deeply prejudiced in favour of General Joffre and the officers of the G.Q.G. Mr. Churchill, in a veiled warning, tells us that there are "higher view points" which the author "could only partially appreciate." This part is concerned mainly with the relations of Joffre and Lanrezac—not unlike those of French and Smith-Dorrien—on which it would be almost impertinent for a foreigner to offer an opinion; and the respective shares of Generals Galliéni and Joffre in the initiation of the battle of the Marne. Neither of these matters greatly concern British readers, but those interested in the Lanrezac case should read, if they have not done so, the General's own simple and straightforward story written after the war, and should remember his unimpeachable behaviour after

his removal from command, his rehabilitation later in the war, the statue erected in his honour, and General Spears' own praise of his masterly conduct of the battle of Guise.

The discussion of the Joffre-Galliéni controversy—a controversy which Galliéni himself deprecated, as there is no dispute that the final decision rested with Joffre—is a distinct blot upon the book. It adds to its great length, and it was uncalled for. General Spears had no contact with General Galliéni in the period dealt with, and was in no way, and does not claim to have been, officially or unofficially mixed up with the liaison between the two French generals. He did not even see them together as he once saw Joffre and Lanrezac. If he felt moved to present the case as an historian, he should at least have given all the essential factors. Before coming to any conclusion on the subject, those interested should read the books of General Galliéni and his Chief of Staff, General Clergerie, and look up the French Official History and note the gaps and disorder in the G.Q.G. records just before the battle of the Marne, which it points out.

The British reader is more interested to know the cause of General Franchet d'Esperey (who succeeded Lanrezac in the command of the French Fifth Army on the British right) failing to come up and to co-operate with the B.E.F. in the battle of the Marne, than in these purely French squabbles. But on this point General Spears, who should know, as he was still liaison officer, is curiously silent. The failure of Lanrezac and French to co-operate was to our advantage, as it entirely deceived the Germans and led to Kluck's wheel past Paris: Franchet d'Esperey's failure to co-operate led to the escape of the German right wing from the Marne, and what that cost the Allies it is impossible to calculate.

There are good photographs and some excellent sketch maps.

Behind the Scenes in Many Wars. By Lieut.-General Sir George MacMunn, K.C.B., K.C.S.I., D.S.O. (John Murray). 15s. 0d.

This is a book which should appeal to military readers. In the first place, it is a pleasantly written record of an interesting career in the Army. Secondly, it is full of anecdotes which will amuse those who enjoy reading between the lines of military reminiscences. But, above all, it is a valuable story of staff work on the communications during the Gallipoli campaign, and again on the Tigris during Maude's advance in Mesopotamia. It is all too seldom that any officer who has held a high administrative appointment puts pen to paper. We hear much of the experiences of the fighting general, but all too little about the work done by his administrative colleagues. In these descriptions of the routine of supply and transport at the Dardanelles there is a mass of detail that merits careful reading. Neither is this detail given in a dull manner, since the author has a facile and picturesque pen. The same might be said of the chapter in which the tribulations of the Remount Branch at the War Office on and after mobilization in 1914 are recounted.

Sir George's career is soon summarized. As a young officer he fought in the Burmese Hills, in Tirah and in South Africa. Then he went to the Staff College and so came to spend some years on the General Staff on the N.W. Frontier and at Simla. Next came the spell with Remounts in London. Then followed the Communications Staff in the Gallipoli campaign, and in Mesopotamia; G.O.C.-in-C. for a few months at Baghdad; finally Q.M.G. at Simla. A varied career, mostly in the East, always in contact with momentous or unusual events—a picturesque life indeed.

We do regret, however, that Sir George should have brought into his book one or two tales that might have been better left unprinted, such as the picture of Sir John Cowans in his office. Neither does the anecdote of Sir Arthur Paget in South Africa cast a true light on one who, in his way, was one of the best soldiers, by instinct, whom we have had in recent times. Lastly, some readers may not altogether endorse the author's freely uttered opinions concerning Lord Kitchener; while others may consider that he is hard on a gallant soldier, Sir Ian Hamilton.

Scipio Africanus in the Second Punic War. By Howard H. Scullard, M.A., Ph.D. (Cambridge University Press). 12s. 6d.

It is curious that two books dealing with Scipio should have been in preparation simultaneously. Yet this is the case. Captain Liddell Hart's book, familiar to most readers of the JOURNAL, came out first. The present work, originally written for the Thirlwall Prize Essay competition, was slower in the writing, while it is more scholarly than military. In spite of the author's painstaking investigation, considerable doubt remains even as to the exact location of Scipio's battles. It seems as though we shall never be able to clear up many of these doubtful points. In this connection there is not so much to choose between the two books. In some respects, as he tells his story, Mr. Scullard, being less enthusiastic than Captain Liddell Hart, views his facts more dispassionately. He is more restrained in his judgments. But he is eminently readable. If written less for the military public than Captain Liddell Hart's volume it is adequate in all military detail and in its descriptions of battles. Perhaps because not too much is known of the "Zama" campaign—or Naragarra as it seems we ought to call it—it appears easy to follow the course of Scipio's operations in Africa. The strategy of that whole phase of the war is certainly full of " lessons." The summing up of Scipio's place among the Great Captains, in which Mr. Scullard quotes Captain Liddell Hart critically, is also worth reading (pp. 274–75).

Taschenbuch der Tanks. By Major F. Heigl. (Lehmansverlag, Munich). 15 marks.

The 1930 edition of this now well-known book on tanks brings Major Heigl's work up to date. It now has over 180 illustrations and deals with the armoured fighting vehicles of thirty-four countries. Armoured cars are dealt with—and many countries possess cars only or else their tanks are few in number and foreign in origin.

Major Heigl does not seem to have access to any particularly secret information, but, by a combination of immense industry and technical judgment, he collects and sorts masses of information and produces a unique handbook on this comparatively new branch of warfare.

It is well known that the British Army was the first to use tanks in war—in September, 1916, at the battle of the Somme. Major Heigl credits us also with the first use of a primitive form of armoured car in the Boer War in 1900. One wonders what became of the idea in the interval between the Boer War and 1914. It is easy to be wise after the event, but one cannot help speculating on the effect of a few companies of British armoured cars on the great German " Aufmarsch " which, with its dense columns on main roads, was at that time singularly vulnerable to armoured car attack and delaying action.

Major Heigl considers that France has in reality made very great progress in tank experiment and design, but he states that this work is kept so secret that the general opinion is that France's man-power army and shortage of money have prevented tank progress in that country.

The Art of War in Ancient India; being the Vishvanath Narayan Mandlik Gold Medal Essay, 1926. By Guvind Tryambak Date. (Humphrey Milford). 4s. 6d.

Students of military history, and, still more, students of military antiquities, will find considerable interest in an account of the method and weapons of war in ancient India. It is a far-reaching collection of facts which does honour to the industry of the compiler. Most informative on the material side, in treating of the apparatus of war, of war animals and war vehicles, it becomes vague and also metaphysical in dealing with strategy and tactics. The diagrams may seem to some readers to have a flavour of General Fuller in their symbolical tendency. But while it is obvious that the science and art of war were cultivated extensively in ancient India, we are left, on the whole, with the impression that the understanding of war was neither so profound nor so practical as in ancient China. Perhaps this impression is partly because the Indian scholar who has compiled the results of his researches is superior in analysis to synthesis.

A Study of the Strategy and Tactics of the Shenandoah Campaign, 1861-1862. With 6 maps. By Lieut.-Colonel A. Kearsey, D.S.O., O.B.E. (Gale and Polden). 3s. 0d.

This volume on the Valley Campaign of 1861–62 appears to be of the same utilitarian quality as the author's former compilations. It should be useful, if read in conjunction with some standard work. It is worth noting that Colonel Kearsey is a great admirer of Henderson's "Stonewall Jackson," although he admits that some of the criticism levelled at that work may be justified.

Notes for Officers Proceeding to India. Published by The Institution of Royal Engineers, Chatham. 3s. 6d.

Although a third edition, this is virtually a new book, having been written afresh, for the second edition appeared eighteen years ago. It is an astonishing compendium of information concerning India, and even contains full historical and sporting notes. It is thoroughly to be recommended to officers ordered to India.

The Complete Guide to Military Map Reading. Ninth Edition, re-written and enlarged. (Gale & Polden). 3s. 6d.

This new edition of a very complete and useful work is virtually a new publication. It includes the normal methods of map-making, and appears thoroughly practical. It is furnished with several test papers.

Royal Army Medical Corps Aids to Dispensing. By G. Ashton, Staff Sergeant, R.A.M.C. (Gale & Polden, Ltd.). 6s. 6d.

This is a purely professional textbook and *aide-mémoire*. It seems to be remarkably complete, going down, as it does, to a thorough discussion of common poisons and their antidotes.

REGIMENTAL HISTORY

Historical Records of the Middlesex Yeomanry. By Charles Stonham, C.M.G., and Benson Freeman, O.B.E., F.R. Hist. S. Published by the Regimental Committee, Duke of York's Headquarters, Chelsea.

This book narrates the story of the Middlesex Yeomanry from the time of its being raised in 1797 as the Uxbridge Yeomanry Cavalry down to the year 1927. There is one chapter on the activities of the Regiment in the South African War; four chapters out of the remaining ten deal with the Great War, when the corps fought at Gallipoli, in Sinai, at Salonica and in Palestine. There are numerous photographs and some appendices.

AIR

Air Annual of the British Empire for 1930. Edited by Squadron Leader Burge. (Gale & Polden). 21s.

This year's issue of the Air Annual of the British Empire is a distinct advance upon the previous issue. The scope of both the statistics and the special articles has been enlarged, and the work may now justly claim to be the best extant comprehensive review of British aeronautics. A considerable section at the beginning of the book is devoted to Empire aviation. It contains articles by Mr. C. E. R. Sherrington on the Economics of Air Transport, by Mr. R. Bourne on Air Survey within the Empire, and by Major F. A. de V. Robertson on Air Transport in the British Empire.

Mr. Sherrington emphasizes the grave danger to economic transport development introduced by State subsidies. They may be used, he thinks, for reducing the prices of air transport both for passengers and freight to such an extent that the result will be cut-throat competition between the national services, ultimately tending, unless checked by agreement, towards a situation wherein all movement involves a loss which is made good by taxation. Mr. Sherrington directs attention to what is too often overlooked—the advantage of elasticity in a transport vehicle—and points out that the aeroplane is able to accommodate itself quickly to changes from one route to another, and that it can be designed to carry small or large loads.

The section on Air Survey, an activity whose importance increases yearly, which since the very beginning has been able to support itself unsubsidised, is complete and instructive. Mr. Bourne suggests that all proposals for an air survey should be subjected to three tests. What facts can it help to elicit? Can it be organized so as to elicit all these facts at the same time? Do the facts likely to be elicited justify the expenditure involved? The use of air survey in opening up hitherto untouched portions of the Empire is shown to be its most valuable asset to this country. Air survey enables the scientific investigator to recognize distinctive regional units suitable for environmental study; to determine the most effective method of selecting samples for purposes of detailed ground investigation, and to derive practical advantages from the use of air photographs in the course of field work.

Major Robertson gives some figures which suggest satisfactory progress by British air transport concerns. He states that, although there may be but few miles of airways in the United Kingdom itself, the number within the Empire is larger than in any other country except America. Australia stands at the head

of the Dominions in having an air route mileage of 6,937, with Canada second with an air route mileage of 6,453. The Imperial Airways Service to Capetown will increase the United Kingdom total mileage by some 5,000 miles.

The section dealing with Service aviation is of great value, genuinely instructive and amply documented, although it would seem that still more space might be devoted to it in the future. The maps, diagrams and illustrations generally are so excellent and so well reproduced that it seems ungrateful to suggest additions to them. But it would certainly be of value if one additional coloured plate were included showing the markings of the various R.A.F. Squadrons. Whenever aircraft are seen passing sufficiently near to distinguish their markings it is of interest to be able to recognise the Squadron.

The volume is a model of accuracy and of comprehensiveness, and it should be in the possession of all who wish to have available a full and reliable account of the present position and the trend of development in British aviation.

Parachuting. By Charles Dixon. (Sampson Low). 12s. 6d.

This book bears the imprint of having been hastily thrown together with the object of attracting the attention of those who like their sensations laid on thick. It is mainly a record of air accidents in which the occupants of the aircraft have escaped by parachute, or rather by one particular type of parachute which shall here be nameless, for it receives sufficient advertisement in the book. The part which purports to give a history of the development of the parachute is unsatisfactory, and takes almost no note of the work that was done at Orfordness during the war, and throughout the style and manner of the book resemble those of the Hollywood caption writer. This is the greater pity in that Mr. Dixon has previously produced a book on parachutes which gives valuable information to all who may be called upon to use them.

When one is striving to attain that bond of sympathy which should link author and reader, Mr. Dixon suddenly checks one with a blatant Americanism; on English aerodromes people do not refer to their aircraft as "ships" nor do they speak of "barrel" rolls. The photographs with which the book is illustrated are good, but even here it is impossible to express unqualified approval for they are very badly reproduced. An interesting fact which Mr. Dixon mentions, and which is borne out by recent American experiments, is that a falling man, before opening his parachute, reaches a terminal velocity of 119 miles an hour in eleven seconds. It was at one time thought that the rate of fall increased to much beyond this figure, and that it might become so high that the person might be suffocated by the rush of air. Unfortunately, the effect of useful and little known facts, such as this, is vitiated by the manner in which Mr. Dixon has chosen to present them.

ADDITIONS TO THE LIBRARY

GENERAL

EUROPE, 1789–1920. By E. R. Turner. 21s. 8vo. (Heinemann, London).

MR. LLOYD GEORGE: A STUDY. By Sir Charles Mallet. 9s. 8vo. (Ernest Benn).

GOODBYE TO THE BATTLEFIELDS. By H. A. Taylor. 21s. 8vo. (Stanley Paul & Co., London).

ECONOMIC PROSPERITY IN THE BRITISH EMPIRE. By Stephen Leacock. 7s. 6d. 8vo. (Constable & Co.).

BENGAL LANCER. By F. Yeats-Brown. 9s. 8vo. (V. Gollancz).

THE EXPANSION OF EUROPE. By W. C. Abbott. 16s. 8vo. (G. Bell & Sons, Ltd.).

THE BEGINNINGS OF MODERN EUROPE: (1250–1450). By E. Emerton. 8s. 6d. 8vo. (Ginn & Co., London).

NOTES FOR OFFICERS PROCEEDING TO INDIA. (3rd Edition). By Colonel F. C. Molesworth. 3s. 6d. 8vo. (Institution of Royal Engineers, Chatham). Presented by the Publishers.

THE GREAT WAR, 1914–1918. By Major-General Sir George Aston, K.C.B. 2s. 6d. 8vo. (Thornton Butterworth, Ltd.). Presented by the Publishers.

IMPERIAL MILITARY GEOGRAPHY. (6th Edition). By Captain D. H. Cole. 10s. 8vo. (Sifton, Praed & Co.). Presented by the Publishers.

WAR LETTERS TO A WIFE. By R. Fielding. 15s. 8vo. (The Medici Society).

THE KING'S PAWNS. By Lieutenant General Sir G. MacMunn. 5s. 8vo. (The Sheldon Press). Presented by the Publishers.

IMPERIAL AIR ROUTES. By Major A. E. W. Salt. 6s. 8vo. (John Murray, London). Presented by the Publishers.

THOUGHTS OF A SOLDIER. By General von Seeckt. Translated by G. Waterhouse. 8s. 6d. 8vo. (Ernest Benn, Ltd.).

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